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Railway Board for Scotland

A FIRST indication of the form which the reorganisation of British Railways in Scotland may take under the Transport Act of 1953 was made by Sir Brian Robertson, Chairman of the British Transport Commission, speaking in Edinburgh to the Scottish Section of the Institute of Transport on March 24. In announcing that a board would be set up to control the railways in Scotland, Sir Brian Robertson is reported to have said that he would like to see this board made responsible for the co-ordination of the whole of the activities of the Commission in Scotland. This extension of the principle of the Act deserves the closest attention. An adequate degree of centralised control is essential to railways wherever they may be, and the subordination of the docks and hotel services as well as the residual road haulage organisation to one body should be of particular value in Scotland, where long distances and large tracts of sparsely populated country bring special problems. If a reasonable transport service is to be provided under such conditions there should be a degree of rationalisation of road and rail services to that end. Sir Brian Robertson stressed that rates and fares would be kept as low as possible and the managers of the Scottish services had all the liberty they needed for that purpose, but they could not waste public money by quoting uneconomic rates. Among the immediate plans of the Commission for improving services in Scotland, Sir Brian Robertson mentioned the introduction of multiple-unit, light-weight diesel trains, and their use on the Edinburgh and Glasgow services.

Charges in a Competitive Climate

THE annual luncheon of the Mansion House Association on Transport, of which a short account appears elsewhere in this issue, brought many references to the new freedom of charging accorded to British Railways by the 1953 Transport Act. Mr. Alan Lennox-Boyd, Minister of Transport & Civil Aviation, paid tribute to the part played by the Association when this freedom was under discussion before the Act became law, and said that it was of immense importance that the railways should be placed in a good position. Mr. M. F. Barnard, Chairman of the Association, hoped that the Minister would consider sympathetically any financial assistance which might be required by the Commission to implement the expected scheme for the reorganisation of the railways. Sir Brian Robertson pointed out that whatever charges were levied they would always seem too high for the transport user, but rising costs had made increases necessary. The Commission, he said, was making a determined effort to enhance productivity and economy and had asked the trades unions to help towards those ends. It was not the duty of the Commission to discriminate between users of transport. Private commercial organisations, though free to fix their charges, observed a considerable degree of consistency, and the same considerations must apply to the Commission. A stable period is needed, he believes, after the present upheavals in the organisation of the railways and nationalised road haulage, in which the public can be provided with a better service.

British Electric Stock for Brazil

ONE of the largest contracts placed for electric railway equipment has been awarded to the Metropolitan-Vickers Electrical Co. Ltd. by the Central Railway of Brazil. It is for 200 coaches to be built and equipped in this country and 100 sets of electrical equipment for coaches to be built in Brazil. They will provide 100 new three-coach trains for the 3,000 V. d.c. Rio de Janeiro suburban lines. The contract, foreshadowed editorially in our January 1 issue, is financed in part by an International Bank loan of $12,500,000 and worth about £7,000,000. It was obtained in the face of competition from the United States, France, Belgium, Holland, Germany, Switzerland, Japan, and Brazil itself. The electrical equipment will be made at the Metropolitan-Vickers works and the coaches constructed by Metropolitan-Cammell Carriage & Wagon Co. Ltd., Birmingham. The original electrification was carried out by Metropolitan-Vickers before the war, when 180 electric coaches were provided. Rio suburban passenger traffic has more than trebled since 1934, and even with new rolling stock ordered after the war rush-hour conditions are bad. In March, 1952, therefore, tenders for additional coaches were called for, resulting in the new order, which is expected to be completed by the end of 1957. For servicing all the electrical equipment a factory is being built by Metropolitan-Vickers at Belo Horizonte, the capital of the State of Minas Gerais, some 210 miles from Rio de Janeiro.

Controversy and Control

A RESTATEMENT of the objects of train and traffic control was made recently by Mr. L. W. Ibbotson, Assistant to the Operating Superintendent, British Railways, Western Region, in a paper read to the South Wales & Monmouthshire Railways & Docks Lecture & Debating Society at Cardiff. The subject of "control," he says, produces strong reactions, and numbers of experienced railwaymen think that control offices could well be abolished.

After dealing with the relationship between the control office and the staff on the ground, stressing that local initiative must be retained, Mr. Ibbotson deals in detail with the functions of train control. He points out that this complicated problem often is misunderstood. Traffic control is simpler, more obvious, and is the purpose for which all earlier controls were created. The cardinal principles to be observed are movement and regulation. He makes a strong plea for the use of graphs as control records, holding that graphs are the best method of recording train movements, being much superior to train cards and control sheets.

Overseas Railway Traffics

ANTOFAGASTA (Chili) & Bolivia receipts fell from £100,823 for the week ended January 15 to £66,228 for that ended February 19, rose to £77,777 for the succeeding week, fell to £48,948 for the week to March 5, for which three days' holiday in Bolivia, this year, may have been partly responsible, and rose slightly to £54,163 for the week ended March 12, compared with £90,270 for the corresponding week of 1953. No reasons are apparent for these fluctuations. The rate of exchange for the peso fell from 360·60 to the £ during the week to January 15 fairly steadily to 428·93 for that ended March 12; during the corresponding weeks of 1953 the peso, after starting at 348·73, varied in the 330-338 range. The rate for the boliviano this year has been 538·14 to the £, compared with 169-170 last year. Peruvian Corporation receipts for February were soles 9,860,000 and bolivianos 44,230,000, against 8,239,000 and 13,382,000 respectively for February, 1953. Aggregates for the eight months to February 28 were soles 78,909,000 and bolivianos 359,479,000 (compared with 73,030,000 and 134,297,000 respectively). The Peruvian average remittance rate was soles 55·65 as against 42/43 to the £ in February, 1953. The Bolivian official remittance rate was bolivianos 537·08 for restricted amounts, against 169·61 in February, 1953.

Fair Value for Money

THE third and last in the series of statements, giving facts and figures on railway charges and productivity, published recently by the British Transport Commission as advertisements in the daily Press is entitled "The Railway £1." Increases in railway charges, it points out, have not preceded the increases in other costs, but have always followed, and largely been caused by them, and that even at their new level, since the latest increase at the beginning of March, railway freight charges represent fair value for money. The statement quotes official statistics of wholesale prices which show that £1 today can buy, in terms of £1 in 1938, 6s. 3d. worth of goods, whereas for every £1 spent now on freight transport, British Railways give, in terms of the £1 in 1938, 8s. worth of service. Like the preceding advertisements, which draw attention to the relative smallness of the recent railway rate increases for which the Commission has had to gain authority, and to the successful efforts of British Railways to increase their productivity, the last of the three is addressed to intelligent readers. The three statements should do much to put the matter of railway charges in better perspective with an influential section of the public.

The Toronto Underground Railway

WITH the Yonge Street Subway, Toronto, the opening of which last Tuesday is reported on another page, Canada gains its first underground railway. For some years the urgent need to relieve serious street congestion in the business area of the city had been recognised. The present project was initiated in 1942 and work began in 1949 on a 4½-mile north-south line, embodying both cut-and-cover and open cutting sections. Britain has contributed largely to the scheme, the Gloucester Railway Carriage & Wagon Co. Ltd. and other British manufacturers having been responsible for the rolling stock, described in our January 8 issue, and the Siemens & General Electric Railway Signal Co. Ltd. for the signalling. The Toronto Transit (formerly Transportation) Commission operates tram, bus and trolleybus services which have long been regarded as among the most efficient in North America. The new underground railway, with its attractive coaches and stations, will enhance that reputation. The inauguration of the line comes soon after the change of style of the Commission and the enlargement of the area of its services from 75 to 240 square miles.

British Railways Track Renewals in 1954

SOME 1,800 miles of complete and partial renewals of track are planned by British Railways during the current year. Standard flat-bottom rails will be used for 923 miles of new track, and bullhead rails for 449 miles, the remainder being partial renewals such as re-sleepering. The magnitude of the task in the case of the biggest railway system in the world is shown by the quantities of materials needed: they include 250,000 tons of steel rails, 3,500,000 sleepers, and 2,000,000 cu. ft. of crossing timbers. In addition, 9,000 tons of steel will be used to renew 74 miles of conductor rails on electrified lines. The renewal programme also includes 136 bridges, 45 miles of new drains, and 244 miles of fencing and other lineside structures as well as signalling and telecommunication equipment. Relatively mild weather earlier in the year is reported to have resulted in some work being well ahead of schedule, and if conditions remain favourable the goal of 1,800 miles may be exceeded.

Re-opening a Belfast Suburban Line

SEVERAL Members of the Northern Ireland Parliament are reported to seek re-opening of the Belfast-Comber line of the former Belfast & County Down Railway, later absorbed by the Ulster Transport Authority. This is in response to public concern at the road congestion and number of road accidents since the railway was closed. Re-opening, it is suggested, would help to ease the Belfast parking problem, and development of the Comber area as a housing estate is given as another reason. The eight miles between Belfast Queens Quay and Comber would be worked by diesel trains similar to those now working on the Belfast-Bangor line of the U.T.A. For some years before closing, the Comber line enjoyed a fairly frequent steam service, which, however, was not patronised sufficiently to warrant its continuance; doubtless the remoteness of Queens Quay terminus was a factor, besides road competition. It seems unlikely that the line would pay if re-opened, even with diesel traction. The points now cited in favour of re-opening presumably were thoroughly discussed before it was decided to close the line. Road accidents have not often been given as a reason against closing a railway; but this seems generally to be another instance of doing everything possible to keep a line open except use it.

Thos. W. Ward Limited

THE Thos. W. Ward Group of Companies celebrates the 75th anniversary of its inception this year. A history of the growth of the firm has been published and is reviewed elsewhere in this issue. In 1878, Thos. W. Ward, who was then 25 years old, decided to start in business on his own account in a small second floor office in Norfolk Street, Sheffield. He was joined by his brother Joseph, then 15 years of age, who acted as office boy, clerk, and collector. In 1883 a third brother, Arthur, joined the business and in 1886 the Ward brothers undertook their first major dismantling operation at Wingfield Blast Furnaces. The ship dismantling department was formed in 1894. The Albion Works at Sheffield were first used for storage in 1887 and have been extended and improved from time to time. They are now the centre of the firm's organisation. The rail department came into being in 1887 with the purchase of 2,000 tons of rails from the Sudanese war zone. The present day railway activities of the group include trackwork, rails, switches, crossings, wagon building and repairs, and the building of diesel locomotives.

A Complicated Junction Area Resignalled

THE new power signalling brought into use near East Croydon on March 21 and described in this issue, covers what is probably the most involved layout of junctions and connecting lines in the United Kingdom. The central part of this area was controlled until this change from a mechanical signal box known as Gloucester Road Junction, a name which has been transferred to one of the two new power boxes. This box had a 54-lever frame and was opened in 1903, superseding a smaller one called St. James's Junction, dating from 1864. It worked four double-line junctions and originally two crossovers, of which one was later removed. Trains from both West and East Croydon could be directed to three different routes. The working was controlled by Sykes lock-and-block and although the number of signals was not large there was quite an amount of interlocking required, including some of special non-reciprocal type governing the setting of catch points behind trains on the Selhurst spurs, interlocked with the block plunger. The new work, which has closed six mechanical boxes, follows the standard practice of the Southern Region and comprises power lever frames, controlling electrically-operated points, with 4-aspect signals and junction indicators for a 2½ min. headway.

E.C.A.F.E. Inland Transport Committee

THE political and railway geography of Asia before the last war did not necessitate any single body to deal with railway transport problems concerning Asia as such. Apart from the railways concerned with Trans-Siberian traffic, there were in Southern Asia and the Far East few international railway connections. The more important railway administrations were, as they still are, members of the International Railway Congress Association, and participated in Congress activities, which are not confined to Asiatic problems. In technical matters, railways in countries ruled or protected by a Western power usually adopted with suitable modifications the railway practice in the Western country concerned, which also would naturally be the source of their railway material and much of their senior staff; but even in independent States such as China, Japan, or Thailand there was a tendency, varying in China with the individual railway concerned, to deal in such matters with one Western country.

The political changes in Asia during and after the war and the setting up of the United Nations Economic Commission for Asia and the Far East, with its Inland Transport Committee and Railway Sub-Committee, have changed the situation radically. E.C.A.F.E. embraces Southern Asia east of and including Pakistan, South Eastern Asia, and the Far East. Most of the territories concerned now are sovereign States; and the E.C.A.F.E. Inland Transport Committee and Railway Sub-Committee now provide means of considering railway problems affecting the area concerned as a whole and of taking concerted action.

The progress made by these bodies is shown in the report of the third session of the Inland Transport Committee held in Kandy in February, which has been sent us by Mr. M. S. Ahmad, Chief of the Transport Division. The session was attended by some 70 delegates from all member and associate member Governments concerned in E.C.A.F.E. These were: Burma, China, France, India, the Netherlands, Pakistan, the United Kingdom, U.S.A., and U.S.S.R. (member States); and Cambodia, Ceylon, Japan, Korea, Viet-Nam (associate member States). Indonesia, the Philippines, and Thailand, all of which have extensive railway systems, were not represented. Non-governmental organisations represented included the International Chamber of Commerce. Although the Committee is concerned with all forms of inland transport, its members included a number of railway officers, such as Mr. F. C. Badhwar, Chairman of the Indian Railway Board, and U Maung Maung, Traffic Manager of the Burma Railways; the Minister of Transport, Major Jayawickreme, welcomed delegates on behalf of the Government of Ceylon.

In the field of railways, the main topics were the session of the Railway Sub-Committee held last autumn in France, after the tour of inspection of railways in Western and Central Europe referred to in our October 16 issue; and the United Nations Railway Training Centre now being established at Lahore, as mentioned in our issues of February 12 and 26. The Railway Sub-Committee naturally devoted much time to this regional problem, and expressed its appreciation of the gifts and offers of equipment for the centre made by the British Government and by United Kingdom manufacturers and the Governments of other countries. The scope of the questions raised in founding and operating the centre is shown by the offer of the U.S.S.R. Government to help in the formulation of syllabuses and to supply reference material; and by the gratification of the French-speaking delegations—presumably concerned with the Cambodian and Viet-Nam railways—that courses in French are to be arranged.

Recommendations of the Railway Sub-Committee, approved by the Inland Transport Committee, included the establishment of a working group on claims prevention and settlement; study of track construction and maintenance in the U.S.A. and Japan by a team of engineers from E.C.A.F.E. countries; and study by an additional working group of diesel traction problems. The Committee also considered the collection, analysis, and dissemination of railway and other transport information, and under its auspices studies already are in progress of locomotive boiler water treatment and of repairs and maintenance of rolling stock in workshops.

The Trend of Modern Bridge Design

THE annual bill for examining, repairing and renewing bridges, tunnels, and culverts on British Railways amounts to some £2,750,000. If the cost of delays to traffic is added, the figure is very much higher. Although the expenses incidental to the disruption of normal traffic working during the period when a speed restriction has to be imposed for the reconstruction of a bridge are difficult to assess with any accuracy, they do amount to a very considerable sum. Engineers endeavour to play their part in helping to keep down these expenses. Extra time at a drawing board pondering over ways and means to improve a design so as to shorten erection time and more particularly, to cut down the period during which the speed of trains must be restricted is time well spent. New spans for bridge reconstructions are designed so that they can be easily and quickly put together at site and so that they will need the minimum of attention in the future. The utmost use is made of prefabrication. Whether it be girderwork fabricated in the workshop or concrete units cast in a depot, the quality of workmanship under rigid supervision and shop conditions is invariably superior to what may be expected in the field. Labour on the site costs more; the men may have to be housed away from their homes; and bad weather may reduce output. So even if the new span can be erected alongside the line and subsequently rolled in, the amount of site work should always be kept to a minimum.

Since the end of the war, remarkable changes have been taking place in the design of the medium-span railway bridge. The rising cost of labour and shortages of skilled manpower and materials, particularly steel, have been having their effect on bridging practice; and necessity has given birth to the development of fresh techniques, notably the pre-stressing of concrete, the welding of mild steel girderwork, and the use of high-strength bolts for permanent connections in the field. The Adams viaduct, with its 30 ft. long spans of pre-stressed concrete, has been carrying main-line traffic in the London Midland Region since 1945. Here is concrete pre-tensioned and pre-cast in beams so that it will never be stretched to the limit of cracking. It is high-grade concrete requiring the very minimum of steel for tensioning and reinforcement; and being crack-proof, it can be depended upon to give lasting and reliable protection to the steel inside it. Although

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the post-tensioned beam with end anchorages for Freyssinet cables or Lee-McCall bars has supplanted the beam pre-tensioned on the Hoyer system in underline bridges, the advantages of pre-stressed concrete remain the same; and today, the use of longitudinal pre-stressed concrete beam decks in the construction of spans up to some 55 ft. in length is an established practice in certain Regions of British Railways. The units are pre-cast under controlled factory conditions in the railway concrete depots at Newton Heath and Taunton and, after erection on site, the spans are pre-stressed transversely to ensure proper distibution of the loading across all the beams.

Abroad, comparatively little use has yet been made of pre-stressed concrete for underline bridges, though there is one notable exception in India, where in 1949 spans 60 ft. long were built to carry a metre-gauge line on the Assam Rail Link. There the deck-type spans consist of two pre-stressed concrete main girders with the bridge timbers to which the rails are spiked laid directly on the top flanges. The girders, cast and post-tensioned in the field, are unusually deep for pre-stressed concrete work; the idea being that the spans could easily be replaced with conventional steel girders should the experiment—it was the first time pre-stressed concrete had been used in an underline bridge in India—prove unsatisfactory. Such a step is hardly likely to be necessary, for Mr. S. Karnail Singh, the Engineer-in-Chief, has been very pleased with the behaviour of these spans under traffic and has prophesied the use of pre-stressed concrete for many more medium-span railway bridges in that country in the future. Recent reports from the U.S.A. where tests on units for an underline span have given very satisfactory results, show that the use of pre-stressed concrete is contemplated there too.

Admirable as the multiple beam form of construction is for deck-type spans, it cannot be used where construction depth (the depth of the span measured from rail level to soffit) limits the depth of the beam to less than about one-twentieth of its effective span length, or where, in the case of longer spans, the problem of transporting and handling very long beams would be too difficult. It is perhaps in the design of the through-type span that the most sweeping changes have been taking place. The through-type plate girder span with steel cross girders, stringers, and a plate deck waterproofed all over on top involves much site work while the various parts are being put together and riveted, and the underside presents a large area of steel which has to be painted every few years.

In Germany, site-assembly has been eliminated by completing the span in the fabricating shops and then turning it over on its side to bring it within the minimum structure gauge for transporting by a special wagon to site. Spans up to 55 ft. in length have been dealt with in this manner.

In Britain, some pre-fabricated, all-welded, single-track spans of similar length have been put in the line outside Waterloo. They were transported the right way up as out-of-gauge loads; the distance from Battersea Wharf, where they were unloaded, from barges, is only a mile or two. Generally, however, the movement of completed spans by rail is too difficult; and the trend of design is towards spans having the decking pre-fabricated in units as large as can be conveniently conveyed by train. At site, the units are connected to the main girders with high strength bolts. Although riveting is still being used in the construction of some bridges, welding is now an established practice for the fabrication of mild steel bridgework. For spans exceeding 85 ft. in length it is sometimes more economical to build the main girders in high tensile steel and as no satisfactory technique has yet been developed for welding H.T.S. such girders are invariably riveted. For shorter spans, however, the main girders are generally welded, increasing use being made of automatic welding processes. Special attention is paid to the avoidance of such features as fillet welds across the tension flanges or sudden changes in flange section which might promote notch-brittleness; and the steel for parts in tension is specified to have a carbon content not exceeding 0·20 per cent and the manganese content may not be less than 2½ times the carbon. In some cases, a minimum Izod value of 15 ft.lb. at a temperature of minus 20 deg. C. is called for.

As reported in *The Railway Gazette* of December 4, 1953, and February 5, 1954, spans have been constructed with welded mild steel plate girders and pre-fabricated deck units of pre-cast pre-stressed concrete; and such bridges are to be found in the line near Birmingham, Carlisle, Exeter, Great Malvern, and Northampton. With this form of construction there is no site-riveting or site-welding required during erection, the deck units being connected to the main girders by high strength bolts. In the London Midland Region, the decks are waterproofed overall, T-shaped steel ties are provided between the main girders and the whole deck is pre-stressed longitudinally after the bridge has been assembled; but in the Western Region designs, waterproofing is confined to the transverse joints between the units, the ties and longitudinal pre-stressing are omitted, and except in the first bridges so constructed, the steel on the ends of the units and the insides of the main girders is left exposed for examination and painting. Despite the small differences between the Euston and Paddington designs, the forms of construction are similar in that site work has been reduced to a minimum, the surfaces to be painted underneath are confined to the bottom flanges of the main girders, and the high grade crack-proof concrete should need no attention in the future.

Whilst the above touches only briefly on this aspect of railway engineering, these changes in bridging practice are worthy of attention. And this year, when the British Transport Commission will be hosts at the sixteenth International Railway Congress to be held in London in May, there will be much to interest our bridge engineers from overseas.

Survey of British Railway Standard Locomotives

THAT we are entering upon the last phase of steam traction in this country is the opinion expressed by Mr. E. S. Cox, Executive Officer (Design), British Transport Commission, in his paper recently delivered before the Institution of Locomotive Engineers, and while the steam locomotive has certain disadvantages, it has also definite advantages, in that defects are easy to diagnose and seldom expensive to rectify, it is cheap in first cost, and, in a coal-producing country, nearly as cheap in fuel costs for many duties as more efficient, but much more expensive, forms of motive power. The British Railways series of standard locomotives, says Mr. Cox, have achieved what they were designed to do and have made a modest contribution to our knowledge. The liquidation of the 19,000 steam locomotives owned by British Railways must necessarily take a number of years, and in the meantime a certain amount of new construction will be justified by the traffic needs.

On developments in the steam locomotive, Mr. Cox can see no future whatever for marked increase in temperature range, which alone can raise the general efficiency level, but which requires increased space and weight which is not available. There remain, however, various useful refinements capable of application, if of proved value, to both existing and to any further new locomotives. The prime objectives in undertaking the series of standard locomotives lie mainly in widest route availability, maximum interchangeability of parts which makes for economy in construction, repairs, stores, and also accessibility to facilitate maintenance. Performance, he points out, is a many-sided subject in which much controversy has been based on arbitrary comparisons having little common ground between them. Drawbar horse-power characteristics of standard locomotives have all been demonstrated on test, and are capable of repetition on the line at any time for minimum periods of one hour given the same conditions.

Quality of coal is obviously important, differences in

calorific value alone, other things being equal, will not markedly affect boiler efficiency, but with a lower heat content more coal is used for a given steam production and maximum boiler capacity is reached sooner. The nature of the coal itself, whether large or small, also does not affect boiler efficiency appreciably, but does vary the maximum steam production which is possible with given draughting arrangements. For example, Mr. Cox shows that British Railways class " 5 " boiler, capable of producing 24,000 lb. steam/hr. with large coal, had its evaporation cut back to 17,500 lb./hr. when tested with washed doubles 2 in. × 1 in. coal of the same grade which had passed through a screen with 2 in. dia. holes, and not through one of 1 in. dia. holes. This is the result of the increase in resistance to the flow of air through the firebed.

As to maintenance, although no recent work has been done on ascertaining the losses due to leakage of steam past valves and pistons, trials on the former L.M.S.R. indicated about 8 per cent increase in steam demand over 30,000 to 36,000 miles when the parts concerned were clean and well lubricated, but with appropriate wear for mileage run. Many British Railways standard engines exhibit similar conditions. Rough riding, caused by wear of axlebox and associated surfaces, place a limit on fast running. The British Railways standard engines have maintained and improved on the best experiences of former companies in delaying this effect, and the use of roller bearings and manganese liners has allowed engines to continue in first class service right up to shopping date. As an example he cites the " Britannia " class on the Eastern Region which continue their mile-a-minute schedules at mileages of 100,000 and over.

These conditions among others make it clear how difficult it is to define the term " run down " and a special series of tests is in hand to quantify its various effects more closely. In the meantime, it has been found that if engines are rostered to work within steam rates which are some 25 per cent less than the maximum established by test, a satisfactory margin is left to absorb the effect of normal variations in coal and mechanical condition. The steam locomotive appears once again to have attained an almost uniform level of potential efficiency. This point has been reached, Mr. Cox states, in the later designs of the former companies and the British Railways standard locomotives working over the same temperature range, and, following the same basic design, equal, but do not materially exceed, the possible achievements of their immediate predecessors.

The Indian Railway Budget, 1954-55

THE Indian Minister of Railways, Shri Lal Bahadur Shastri, opened his recent budget speech on February 19 by announcing the final accounts for 1952-53. Gross traffic receipts and ordinary working expenses compared with the revised estimates, given in brackets, were Rs. 270·56 crores (Rs. 269·55 crores) and Rs. 187·96 crores (Rs. 188·85 crores), respectively. The net surplus after contribution to the depreciation reserve fund, payments to miscellaneous expenditure, and dividend to general revenues stood at Rs. 13·19 crores (Rs. 9·48 crores). Rs. 12 crores were appropriated out of the surplus to the development fund, and the balance of Rs. 1·19 crores to the revenue reserve fund. In the revised estimates for 1953-54 gross receipts were expected to total Rs. 272 crores (Rs. 272·28 crores in the budget estimates), and working expenses Rs. 197·63 crores (Rs. 190·99 crores); the corresponding surplus was Rs. 3·18 crores (Rs. 9·31 crores). Rs. 1 crore is equivalent to £750,000.

Before dealing with the budget estimates for 1954-55, the Minister explained that as from April 1, 1954, inter-railway and inter-departmental adjustments in accounts—in abeyance since the regrouping of railways—would be restored, and the financial results of individual railways would again be shown separately, and each railway administration would be able to make comparative assessments of its own financial results and economics of working. The budget estimates have been prepared accordingly, and the following table shows them as compared with both the budget and revised figures for 1953-54; all figures in it are in crores of rupees (one crore = 100 lakhs = Rs. 10,000,000):—

—	1953-54			1954-55
	Budget estimate	Revised estimate	Increase + or decrease —	Budget estimate
Receipts—	Rs. crores	Rs. crores	Rs. crores	Rs. crores
Passenger & coaching	120·28	119·26	−1·02	119·01
Goods	147·60	147·13	−0·47	148·60
Miscellaneous (net)	4·40	5·61	+1·21	5·64
Total receipts	272·28	272·00	−0·28	273·25
Working expenses	190·99	197·63	+6·64	194·31
Depreciation fund	30·00	30·00	±0·00	30·00
Payments to worked lines	0·21	0·24	+0·03	0·22
Total expenses	221·20	227·87	+6·67	224·53
Net traffic receipts	51·08	44·13	−6·95	48·72
Net miscellaneous expenditure	7·00	6·49	−0·51	8·08
Net revenue	44·08	37·64	−6·44	40·64
Dividend to general revenues	34·77	34·46	−0·31	35·50
Net surplus	9·31	3·18	−6·13	5·14

The only considerable difference between the 1953-54 budget and revised figures was thus in working expenses. These were inflated to the extent of Rs. 3·15 crores by the implementation of the recommendations of the Gadgil Committee to treat 50 per cent of the Dearness Allowance paid to employees as pay; and by the increased diversion of coal by sea for the Southern, Central, and Western Railways, to enable more coal and other commodities to be carried by rail in response to industrial and other public requirements; this accounted for a further increase of Rs. 1·39 crores. Among other causes for the rise in working costs were the provision of additional protection works against flood damage, and increased repairs and maintenance of rolling stock, machinery, and electrical plant.

A sum of Rs. 3·32 crores less than the 1953-54 revised figure for working expenses is allowed in the 1954-55 budget under this heading. This expected decrease is caused partly by credits for freight charges on stores used on works, and partly by reduced provision for special items such as the diversion of coal by sea. There are other minor expected decreases in expenditure, but these are likely to be offset by annual increments to staff, amounting to nearly Rs. 1 crore a year. With an appreciable rise in expected net miscellaneous expenditure, and about Rs. 1 crore higher dividend payable to General Revenues, a net surplus of little more than Rs. 5 crores could be estimated.

On the developmental works side, the 1954-55 budget allows Rs. 4¼ crores for the 16 new railway constructions in hand, including Rs. 1 crore each for the Southern Railway Quilon-Ernakulam line—96 miles, of which 37 are expected to be open for traffic in 1955—and for the great Ganges bridge near Mokameh, estimated to cost Rs. 14·60 crores, including provision for a roadway. It is of interest to note that the Ambala-Kalka section of the Northern Railway has now been diverted between miles 147 and 152 to serve Chandigarh, the new capital of the Indian Punjab, at present under construction.

Four more lines dismantled during the war have been restored during the current year, and Rs. 1·43 crores are allowed in the budget for the restoration of six others upon which work is in hand. A sum of Rs. 0·20 crores is also included for the electrification of the Eastern Railway main line between Howrah and Burdwan, estimated to cost Rs. 7·1 crores; this is the first part of the Calcutta suburban electrification scheme to be taken in hand.

The provision in the 1954-55 budget for rolling stock is Rs. 52·58 crores, an abnormally high figure explained largely by the fact that 1,000 locomotives will have become overage during the five-year period beginning 1951-52, in addition to the considerably larger number overage at the begin-

ning of that period. The table below shows the 1954-55 programme of new acquisitions:—

—	To be obtained from abroad	To be obtained in India	Total
Locomotives	735	100	835
Boilers	33	19	52
Carriages	124	1,017	1,141
Wagons	5,030	10,974	16,004
Cranes	20	16	36

Orders for 515 locomotives involving an expenditure of Rs. 22·5 crores have been placed on the basis of global tenders in Western Germany, Austria, Italy, and Japan. Also 120 5 ft. 6 in. gauge passenger locomotives are to be received from Canada under the Colombo Plan, and 100 goods locomotives of that gauge and 5,000 wagons are to be received from the United States under their Technical Co-operation Mission Aid Programme. The Minister acknowledged the assistance given by these two latter countries in his speech. The out-turn target for the Chittaranjan Locomotive Works is to be stepped up from 120 to 150 a year, and the eventual aim is 200. The Tata Locomotive & Engineering Company's target is 50 locomotives a year.

The policy of obtaining all coaches in India is to be continued. The Hindustan Aircraft capacity has been raised and the Government's Integral Coach Factory at Perambur is expected to begin producing body-shells late in 1955. The number of Indian firms embarking upon wagon-building is increasing. In view of the number of recent accidents to passenger trains within a short period, a committee has been set up to investigate the matter and make recommendations to reduce the incidence of such accidents.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

S.E. Extension of Bakerloo Line

March 13

SIR,—An extension of the Bakerloo tube to Camberwell is contemplated, but even the London Working Party plan for an extension further south is tentative. By extending the Bakerloo through Camberwell to come to the surface in the Southern Region cutting west of Peckham Rye Station, about 2¼ miles from Elephant & Castle direct, a useful connection could be made. Platforms for the tube trains could be provided between the two adjacent stations at Peckham Rye. From Peckham Rye to Nunhead, the viaduct is already built for four lines, which would allow the tube extension to run alongside the former S.E. & C.R., and then take over the working of the Crystal Palace High Level branch.

The latter branch is threatened with suspension of its services for the third time. With Blackfriars as a London terminus it is not surprising that little traffic offers outside the City peak periods, and the Working Party tentative proposal of a link with the Northern City line (Route K) still leaves the area served without direct access to the West End, which is its greatest need.

Yours faithfully,

R. G. R. CALVERT

10, Bolton Avenue, Windsor

French Railways Speed Record

March 22

SIR,—I think that Mr. Beedham's observations will find an echo in the minds of many railway travellers in Britain, not forgetting the necessary caution one has to observe in reaching any general conclusions; this, of course, manifests itself in the editorial footnote in your March 12 issue.

Whilst, however, engineers in this country are being urged to push our production figures up in world markets, we cannot expect much success if we lose the advertising effect of such exploits as are gained from records of this kind.

While an outstanding record does not prove the general efficiency of the services such as is aimed at by British Railways, it does create a selling value in the world at large as the pages of railway history go some way to prove.

It is evident, too, that the French railway authorities are not making the error of merely concentrating on a few spectacular performances; this is clear from the interesting report in your issue of March 19, giving details of the many improvements being introduced in the summer services, Paris-Berne, Paris-Brussels, and Paris-Amsterdam. There is evidence here of that daring and enterprise of which the French people as a nation possess great store.

What we in Britain have to fear is that our own authorities are tending too far to the opposite extreme and creating the belief that our energies are sapped and our spirits abated, not to mention a depressing caution when it comes to financing new enterprises and capital restoration in the nation's equipment and public services. In this particular sphere a bolder and much more inspiring policy is needed.

While I do not imagine that the railway authorities are entirely at fault in this and while we must place on the shoulders of the Government their fair share of the responsibility, I feel very disappointed when I read about the rather meagre plans for new equipment for British Railways in the same issue of *The Railway Gazette*, and I am sure that many people well equipped to judge will agree with me that the pace needs quickening in more respects than one. We are making fair progress, but I would certainly not regard it as meriting the term "good."

Yours faithfully,

B. NEWTON BROOK

"Vistabay," St. Hilary's Drive,
Deganwy, North Wales

Diesel Operation of Santa Fe

March 16

SIR,—A paragraph on page 292 of your March 12 issue calls the Atchison, Topeka & Santa Fe Railway, with 9,099 route miles, the second largest railway in the U.S.A. Along with the parent railway, two affiliated railways are operated under one executive officer as a single unit. These "Santa Fe Lines," as they are termed, extend to 13,072 miles of road and constitute the longest railway in the States.

The Pennsylvania, with 9,959 miles of road and 25,110 miles of track, is the greatest railway, judged by size of traffic and equipment. In 1952 the Pennsylvania ran 40·8 million freight train miles and the Santa Fe 30·7 million: they both worked 21·7 in train miles by diesel power. The Pennsylvania ran 35·5 million passenger train miles—15·7 million being worked by diesels; the Santa Fe ran 24 million, working 19 million by diesels.

Considering that before the war the Pennsylvania electrified 665 miles of road, involving 2,250 miles of track, in its busy eastern region, its Board took a bold step forward in deciding to replace steam by diesel power instead of converting further sections of main line to electric operation. No time was lost in installing diesel-electrics. In 1952, the Pennsylvania consumed 2,245,000 fewer tons of coal than in 1951, but used 34,542,000 more gallons of diesel fuel. That is only one example of the changes which the rise of the diesel is making in the U.S.A. national economy. More railways may go "100 per cent diesel" soon, but the Santa Fe can hardly be said to do so while it keeps a stock of steam locomotives in reserve to deal with traffic peaks.

Yours faithfully,

R. BELL

Frognal, N.W.3

THE SCRAP HEAP

On Guard Against Accidents

Some rules for railway travellers from "The London Journal" of April 15, 1854

It is an excellent general maxim in railway travelling to remain in your place without going out at all until you arrive at your destination. When this cannot be done, go out as seldom as possible.

Express trains are attended with more danger than ordinary trains. Those who desire the greatest degree of security should use them only when great speed is indispensable.

Special trains, excursion trains, and all other exceptional trains on railways are to be avoided—being more unsafe than the ordinary and regular trains.

Beware of yielding to the sudden impulse to spring from the carriage to recover your hat which has blown off, or a parcel dropped.

Galvanising the Public

A circular addressed "to the travelling public" [when the first N.E.R. Tyneside electrification was inaugurated on March 29, 1904] pointed out to intending passengers that they would be using the first public service of electric trains on any large railway system in the country and appealed for their co-operation in making the venture a success.

In particular the merits of electrification were emphasised—"the physical exhilaration of travelling rapidly and noiselessly in light, airy, comfortable, clean, and attractive coaches." Readers were urged to adhere to what were then, at any rate, evidently regarded as the three duties of an electric rail passenger—move quickly! travel often! and take little luggage!—*From "The Manchester Guardian."*

Half-a-Mile on a Coupling Hook

A Signal & Telecommunications department employee of British Railways had an unusually lucky escape near Hove. He had been working on the line and was walking down the track when two light engines bore down on him. He managed to seize the front coupling hook of the leading engine and was carried along for about half-a-mile until the locomotives were stopped by a gang of platelayers. He was taken to hospital with a fractured wrist and a lacerated knee.

"Awkward for the Coo"

Reference to an early British counterpart to the cowcatcher was made, according to a correspondent, in 1839 in the *Morning Advertiser,* which under the heading "A Railway Warner" states: "There is an ingenious contrivance by which accidents may be effectually prevented. It consists of a bar of iron fixed in front of the engine at a small distance above the rails, crossing the whole breadth of the road, which pushes any obstructing body before it, and when so obstructed, rings a bell, which gives notice to the engineer. The benevolent inventor allows the use of this contrivance gratis."

About this period also a civil engineer named Millar made and tried what he termed an "accident bar," but little information about it appears to be extant.

Cowcatchers are understood to have been in fairly general use in the U.S.A. by 1839. George Stephenson, asked if it would not be "awkward" if a cow were run into by one of his locomotives, made his oft-quoted remark that it would be "awkward for the coo," without referring to any contrivance in this country for removing such obstacles.

Bridge Work

The Tay Bridge, we see, is to be closed to traffic for some weeks on Sunday mornings so that a full inspection can be carried out.

We have no idea how you overhaul a structure the size of the Tay Bridge. Does one begin at one end with a hammer and chisel and work to the other, or does the engineer content himself with selective samples? Or does one run goods trains with ever increased loads over the bridge to see how much it will take without groaning? It would be rather impressive to see the Tay Bridge supporting a couple of dozen well-laden goods trains on a Sunday morning.—*From "The Scotsman."*

Dream Stuff

I dream of a time
When melodious rhyme
Will portray more lightly,
In language more sprightly,
The pleasures and pains
Of travelling in trains.

For instance, that chain—
It *will* stop the train,
But, pulled without grounds,
It may cost you *five pounds*!

When trains are in motion
"Stay put" is the notion,
What's more, cross the line
By the bridge—ah, that's fine—
Too late to be brave
In a suicide's grave.

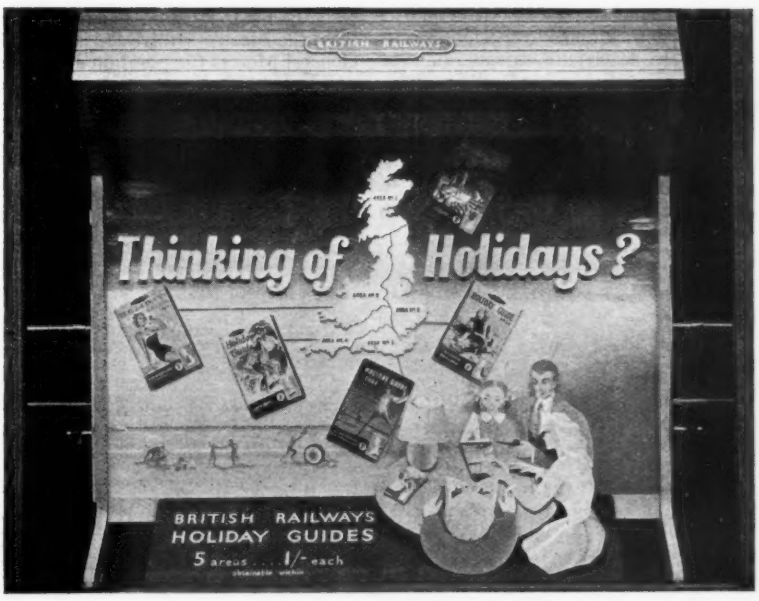
Poor man, you feel lonely?
I fear Lady Sonely
Would deem it most rude
Were you to intrude.

Don't get in a huff
If forbidden to puff;
We know it's provoking
To travel "non smoking."

Some such transformation
Seems due at my station;
It can't be *de rigueur*
That, vibrant with vigour,
Our loud-speaker blares:
"Oi! Get up them stairs!"

A. B.

Hint for the Holidays



Window display arranged by the Department of the Public Relations & Publicity Officer, Eastern Region, at the Inquiry Office at Kings Cross; the stereoscopic effect is obtained by plywood figures against a hardboard background

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NIGERIA

"River" Class Locomotives

The 12 new "River" Class locomotives being built by the North British Locomotive Co. Ltd. incorporate a new type of intermediate drawgear based on the Gold Coast Railway design. It is hoped that this change will have the effect of reducing tyre wear on the Kloof section of the railway, which consists largely of a succession of severe curves. Fifteen more locomotives are being constructed by Henschel & Sohn, G.m.b.H., and will incorporate this alteration but in addition are to be fully compensated.

The Vulcan Foundry is also building 15 similar locomotives for delivery late in 1954. They will incorporate both these features and will also be fitted with roller bearings on all wheels of engine and tender. The locomotives at present in service have roller bearings on the carrying wheels only. M.L.S. regulators will also be provided. On the completion of these orders the railway will have 119 "River" class locomotives in service.

EAST AFRICA

New Wagons

The first of 1,049 large covered bogie wagons on order since early 1952 went into service on March 22. Forty more similar wagons were due to arrive at Mombasa by the end of March and thereafter there will be regular shipments coming in until all have been delivered. The Metropolitan Cammell Carriage & Wagon Co. Ltd. is supplying 755 and Hurst, Nelson & Co. Ltd. 294 of the wagons.

The new wagon was designed in the Chief Mechanical Engineer's Office of the East African Railways & Harbours under the supervision of the Crown Agents for Oversea Governments. It is 41 ft. long compared with the 35 ft. of existing wagons. The carrying capacity is 36 tons 7 cwt. with a gross loaded weight of 52 tons. This loading is up to the limit possible on the lightest section of track in East Africa. Other new features include "dreadnought" ends to provide greater strength and reduce weight; wider doorways of 5 ft. 4 in. compared with 4 ft. to facilitate the use of mechanical handling appliances for the loading and offloading of some types of goods; a special type of door fastening designed specially to prevent pilferage, and axles of larger diameter machined all over to reduce stresses.

During 1954 no less than 2,850 wagons of all types will be delivered for use on all sections. When they have been assembled and placed in service the present shortage of goods stock should be much alleviated.

INDIA

Line to Chandigarh

Chandigarh, the new capital of the Punjab, has been linked with the Ambala-Kalka section of the Northern Railway by an 8½-mile loop line.

CANADA

Forest Conservation Coach

The Canadian National Railways have converted a sleeping car into a lecture coach for the Canadian Forestry Association. The coach will travel through Quebec, Northern Ontario, New Brunswick and Nova Scotia on its mission to teach the safeguarding of forests. Fire prevention and fire fighting are the first consideration. Approximately two-thirds of the coach is devoted to lecture facilities, including seating accommodation for 52 persons, public address system, desk for lecturer and a small room equipped with a film projector. The remainder houses the living quarters of the lecturer.

Many of the communities through which the coach will travel depend on lumbering for their livelihood. News of the visit to a community will be published in advance of arrival in the local newspaper, or by poster.

BRITISH GUIANA

Railway Modernisation

A plan to modernise the railways is estimated to cost Government $1,177,405 within the next two years. Transport in the colony was fully investigated by a World Bank Mission, which recommended a five-year programme of improvements to cost $4,628,000.

A total of over $100,000 has been provided for loops, sidings, bridges, and stations. Improvements to wharves and the station at Georgetown will cost $48,000. Four new diesel locomotives, two new petrol engines and additional wagons are to be obtained.

The railway system comprises 60 miles of standard-gauge and 18 miles of 3 ft. 6 in. gauge line.

UNITED STATES

Large Union Pacific Diesel Order

What is believed to be the largest order for diesel-electric locomotives ever placed by a railway with a single manufacturing firm is for 205 units ordered recently by the Union Pacific Railway from the Electro-Motive Division of the General Motors Corporation and valued at $35,769,410. Completion of delivery is expected by June 1, and the principal U.P. main line between Omaha and the Pacific Coast will then be wholly diesel-operated.

Of the units ordered, 190 will be of the latest Electro-Motive type for

Canadian National Railways sleeping car converted into a lecture coach for the Canadian Forestry Association

freight service, each rated at 1,750 h.p., and the remaining 15 will be 2,400 h.p. passenger units. All will be used in multiple-unit assemblies as required. This will mean the disappearance from this main line of the spectacular 540-ton "Big Boy" 4-8-8-4 locomotives—the heaviest and most powerful steam locomotives in the world—and of the "Challenger" 4-6-6-4 series.

It is emphasised that this notable diesel development will in no way affect the company's continuance of its experiments with gas-turbine-electric traction. At present the 25 4,000 h.p. units of this type are performing successful haulage of heavy freight trains over the 176 miles through the Wahsatch Mountains between Green River and Ogden, Utah.

FRANCE

Lifting a Footbridge at Hirson

At Hirson Station on the Valenciennes-Thionville line is a footbridge which crosses several tracks at a junction. It consists of one long centre span and two approach ramps. In connection with the electrification of the Valenciennes-Thionville line it was necessary to raise the centre span by 2 ft. 6 in. to give the clearance of 17 ft. 6½ in. required for the installation of the 25,000-volt catenary.

The centre span weighing 70 *tonnes* after being lifted the required amount by the use of four 50-*tonne* hydraulic jacks, was supported at each end on U-shaped steel girders resting on the top of the oringinal supporting pillars. The paving was removed from the ends of the reinforced concrete approach ramps which were extended under the centre span to connect with the bottom of the bridge deck. The intervening space was filled in with concrete and the top of the approach ramps raised to form a footpath continuous with the deck of the bridge. The entire work was completed within a month.

Deficit on Suburban Services

Passengers on the suburban lines in Paris pay less than a third of what it costs to transport them, according to information given to the transport commission of the National Assembly by the Chairman of the National railways. The cost works out at fr. 6·70 for carrying a passenger one km., that is about 2¼d. for carrying a passenger for a mile. The passenger, however, only pays an average of fr. 2·04, that is just over ½d., a km. The State contributes two francs to keep down the cost of living. The rest goes to swell the railway deficit for which the State is ultimately responsible.

SPAIN

Diesel Service to North West

To improve the service between Avila, Salamanca, Zamora, and Astorga, one of the units of the Fiat diesel trains running between Madrid and Vigo and Corunna is now detached from the main train at Avila and runs via those places, rejoining at Astorgo the other coaches which meanwhile have travelled via Valladolid.

ITALY

High-Speed Electric Services

The high-speed electric service between Milan, Rome and Naples which was due to begin on March 1 has been cancelled. Instead the stock will take over the running of the present trains R522-R527 from April 5 and provide a daily return service between Rome and Milan as trains RM-MR. Departure from Rome Termini will be at 10.15 and arrival at Milan 16.55; the return service leaves Milan at 17.25 and reaches Rome at midnight.

The service will be first class only with a supplement of 20 per cent, instead of the 45 per cent previously charged.

HUNGARY

Premiums for Quick Turnround

To encourage speedy unloading of goods trains, the State Railways have begun a system of premiums to unloading staffs at factories. The premium is paid on a basis of improvement of time over last year's figures.

Publications Received

The Royal Society of Arts, 1754-1954. By Derek Hudson and Kenneth W. Luckhurst. London: John Murray, Albemarle Street. 8¼ in. × 6 in. 411 pp. Illustrated. Price 30s.—As this book is a publication of the Royal Society of Arts it would be superfluous to praise the elegance of its format and binding and the excellence of its illustrations. What may well come as a surprise to the reader is the dry humour with which the subject matter is treated, and the subtle handling of the many anecdotes included in the account relating to the long history of the Society. The whole provides much enlightenment on the oddities of the English character, and forms a book to which one could return again and again.

Outline of Progress, 1878-1953.—The 75th anniversary of the inception of the Thos. W. Ward Group of Companies is the occasion of the issue of a limited edition of a 212-page volume describing the growth of the undertaking from its small beginnings to the present day. A foreword is contributed by Mr. George Wood, who was at that time Chairman of Thos. W. Ward Limited and of several of the other member companies of the group. Mr. Wood is now Vice-president of the company. The book deals not only with the parent company but also with the many subsidiary and associated undertakings. There are photographs and sketches illustrating both past and present activities of the group and a double page colour reproduction of a painting by Charles Cundall of shipbreaking at Inverkeithing. The railway activities of the group are described in detail. The anniversary is the subject of editorial comment on another page.

The Locomotives of R. E. L. Maunsell. By O. S. Nock. Bristol: Edward Everard Limited, 38, Broad Street, 9¼ in. × 6½ in. 192 pp. + 37 pp. plates. Price 17s. 6d.—For nearly a quarter of a century, the office of Chief Mechanical Engineer on the South Eastern & Chatham Railway, and its successor, the Southern Railway, was held by the late R. E. L. Maunsell. After his early training on the Great Southern & Western Railway of Ireland, as a pupil of H. A. Ivatt, and experience on the Lancashire & Yorkshire, and in India, he became Works Manager at Inchicore in 1896, and Locomotive, Carriage, & Wagon Superintendent in 1911. Two years later, he succeeded H. S. Wainright on the S.E.C.R., and the reorganisation of Ashford Works and the change in locomotive policy for which he was responsible are landmarks in British railway history. In the wider field of the Southern Railway, the remarkable performances of the "King Arthur," "Lord Nelson" and "Schools" classes afford further proof of the excellence of his designs. In this review of Maunsell locomotives, Mr. Nock presents technical detail against a background in which the engineer and those associated with him appear as something more than shadowy figures.

Tubular Equipment for Material Handling.—Many illustrations of steel tubes as pallets, stillages, stacking crates, and so on, are given in an illustrated book published by Tubewrights Limited. This firm has also evolved the Pallage system, by which a wide range of materials handling equipment can be built up from standard components. A variety of pallets is available with various carrying capacities. Equipments to meet any kind of special requirement also can be designed.

Bakelite Moulding Materials.—Broadly speaking, materials classed as plastics are usually based on synthetic resins which are cast, moulded or directly polymerised into shape. Selection of the right plastic for the job is essential, and an illustrated booklet recently issued by Bakelite Limited describes the general properties of mouldings made from Bakelite phenolic moulding materials, and contains information for the guidance of prospective users and designers. The booklet is merely a guide, and for technical advice on any problem the firm should be consulted.

XUM

Sixteenth International Railway Congress

Railways and Road Transport

Participation in the carriage of passengers and goods by road services

REPLIES from 23 railways in Great Britain and the Commonwealth, Denmark, Egypt, Eire, Finland, Iran, the Netherlands, Norway, Sweden, and the U.S.A. were received to a questionnaire forwarded to 38 railway administrations in connection with Question 9 for consideration by the International Railway Congress in London next month. A report based on these replies has been compiled by Dr. J. P. B. Tissot van Patot, Chief of the Cabinet & General Policy Division of the Netherlands Railways.

Railways, it is agreed, may operate road vehicles in three ways; direct, indirect, and semi-direct. In the first of these, vehicles are used within the railway undertaking, in the second contracts are made with road carriers to operate given services, and in the third the railway participates in a new or existing concern which operates road vehicles. The last form has many attractions in that the road haulage concern operates under exactly the same conditions as its non-railway owned competitors. In some countries, where various forms of licensing exist, this is the only way in which a railway can build up a road transport organisation.

Freedom of Action

In countries where railways have been nationalised and become part of a general transport organisation they are, in general, not entitled to operate road vehicles, although they may sometimes continue to operate collection and delivery services. The transport organisation of which they are a part is entitled to develop road services.

Replies from British Railways throughout referred to conditions before the passing of the Transport Act, 1953, and many of the points put forward in connection with British practice are no longer applicable.

The independent railway undertakings which form the second group have in almost every case the right to operate road services. All three methods of organisation are in use and the direct system is generally used in conection with freight traffic and to some extent with passenger traffic. Contracts are frequently made with road operators to provide freight services but less often for passenger services. The semi-direct system is used by the railways in the U.S.A., the Finnish State Railways, the Indian Railway Board, the Netherlands railways, and the Norwegian and Swedish State Railways.

Authority to operate road vehicles is usually connected with a licensing system and in some countries special government approval must be obtained. Nationalised railways consider, in general, that their status has not promoted road transport participation, but some of them have been encouraged to do so by the co-ordination policy of their governments. Many railways have no freedom to follow up technical possibilities and customers' requirements.

Extent of Undertakings

Railways which do not operate road services have usually had insufficient competition from road hauliers to make the step necessary, and in some cases this is the result of governmental protection. Where road competition is strong railways have a motive to set up their own services. Other motives include rationalisation and a desire to improve the quality of service offered. These aims appear to be as readily met by semi-direct as by direct participation. The only undertaking giving a motive other than railway considerations as its sole reason for operating road transport is the Rhodesia Railways. In Rhodesia, where outlying districts were being opened up in 1927, it was found that animal-drawn transport was unsatisfactory and the normal development of the country was being retarded as a result.

The types of road activity in which railways engage are manifold. There has been extensive use of passenger road vehicles to operate services parallel to those of the railways and in some cases bus services have been substituted for particular trains. In a few cases the entire passenger train service has been withdrawn in favour of buses. The main use of lorries is to operate collection and delivery services but the transport of full load traffic also occurs. To a small extent lorries have been used to replace a railway completely closed to traffic. In the Netherlands the introduction of the lorry gave an opportunity to revise the transport of piece goods. The country is divided into 36 groups with a railhead for each group. Between the railheads transport is by rail but collection and delivery at railheads is by road. No less than 1,800 wagons, representing 27 per cent of the covered wagon stock, were saved by this system and a large number of stations ceased to handle this type of traffic. Few railways use road-rail transport by road-rail trailers or other mixed vehicles.

Networks operated by bus services are in some cases much larger than the railway network open to passenger traffic. These services tend to take on the nature of feeder routes to the railways. The number of passengers carried by bus is usually smaller than that carried by rail and the average distance is less. Bus fares tend to be higher than those charged by the railways. In the total passenger road transport available in the countries concerned the railway bus services hold a position of importance. In the case of freight transport the volume is usually small in comparison with the total carried by either rail or road.

Railways appear to find it expedient not to attempt to control in any way the road operators working under contract to them, but with semi-direct operation it is usually the practice to appoint members to the board of management. The authority to do this lies in the extent of the shares held in the road transport concern.

Special organisations for internal co-operation between railways and affiliated road transport undertakings exist only with the Norwegian State and Netherlands railways. The latter also have co-operating organisations engaged in the rationalisation of the affiliated companies.

Statistics

The number of buses operated by or on behalf of railway administrations varies considerably. The highest is 2,060 by the Indian Railway Board and the lowest 65 by the Nora Bergslags Railway of Sweden. The number of passengers carried for each kilometre of route varies from 11,542 in the Netherlands to 1,442 in India. The average distance each passenger is carried ranges from 25·8 km. in India to 1·8 km. in New Zealand. The statistical information is, however, incomplete. The number of passengers carried annually for each vehicle seat show that the Netherlands occupy the leading place with a figure of 1,900. The Swedish State Railways show the lowest number which is 900. Depreciation periods vary but average between 7 and 10 years. In India the figure is four years and in Finland five. These low figures are probably connected with the condition of the roads or the influence of the climate in those countries.

In the case of goods transport the average capacity of vehicles is a figure given by only three administrations. Of these, British Railways showed by far the lowest, 2·2 tons. On the other hand the figure of tonnage carried for each ton of capacity shows British Railways to be the highest, 464. This figure may depend partly on the distances which goods are carried in the respective countries. The number of tons carried for each vehicle is highest

in Sweden, 3,275, which is much higher than the second country, the Netherlands, with a figure of 1,452. The pre-eminence of Sweden is accounted for by the fact that in that country the railway road services are used for the delivery of wagon loads to the consignee's house. In almost every case the depreciation period for lorries corresponds with that used for buses.

The administrations were asked to express various comparisons between their road and rail passenger services in the form of percentages. The Nora Bergslags Railway states that its road route length is 581 per cent of the railway route length, the number of road passengers 1,000 per cent and the receipts 600 per cent. In the Netherlands the corresponding figures are 376, 69, and 21 per cent and in most other cases the road route length exceeds the railway route length but the number of passengers and receipts generally are smaller.

Financial Effects

Railway investments in road transport undertakings are small in proportion to the investments in the railways themselves and the dividends from such undertakings make a modest contribution to the revenue of the railways as a whole.

There is moreover an indirect influence on railway receipts which is dependent on the division of tasks between rail and road. The railways have usually found economic benefits to accrue from their participation in road services, the service to the public by road and rail has improved, and the ability to face competition has been greatly strengthened.

The report concludes with two recommendations based on the collated facts provided. The first is that, since such favourable results have been achieved by semi-direct participation in road services, railways should give full attention to the possibilities to enable them to expand to the status of general hauliers, and the second is that railways should be at liberty to employ road services to reduce their costs of production and rationalise and improve their services.

Problems of Staffing the Railways

Recruitment : replacement : qualifications

THE modernisation of recruiting methods, staff replacement, the balance between permanent and temporary staff, and the function of the medical services in regard to recruitment, are subjects considered in Question 7 for discussion by the forthcoming International Railway Congress in London. A report on these matters has been drawn up by Dr. A. Huyberechts, Directeur General Adjoint, and R. Berghmans, Inspecteur en chef a la Direction du Personnel et des Services Sociaux, Belgian National Railways.

The questionnaire on which the report is based was drawn up in collaboration with Mr. F. Lemass, General Manager, Coras Iompair Eireann, an account of whose report appeared in our issue of March 12. Of the 67 administrations, mainly European, which received the questionnaire, 25 supplied useful information.

The distribution of staff according to function shows marked variations. The percentage of skilled workmen ranges from three to 47, unskilled workmen from 19 to 65, supervisory staff from one to 35, clerical staff from 6·5 to 63·5, officials from 0·5 to 2·5 and technicians from 0·25 to 1·75. Distribution by status is rather more even, permanent staff varying in general from 75 to 99 per cent, but some colonial railways fall greatly below this figure. On the Cambodian Railways the temporary labour force accounts for over 80 per cent of the total. The intake of temporary staff is conditioned by the amount of seasonal work and the need for more economical working. There are few disadvantages inherent in the engagement of temporary staff but there is sometimes trade union opposition. The Portuguese and Swiss Federal Railways consider temporary staff to be of inferior quality.

Recruitment

The advertising of vacancies in the press and on the radio is frequent and some railways make use of various types of labour offices. All the undertakings recruit staff from schools, technical training centres, and universities. Testimonials relating to character are required and these are often completed or even replaced by an enquiry from the police. Recruiting is usually continuous but many railways have suspended all recruitment in view of their current financial difficulties.

Training may either precede or follow engagement and may include either practical training or a period in a railway school or similar establishment. Probation periods vary from one month to two years, after which, in many cases, there is an interview and a final examination. Temporary staff have priority of consideration for permanent vacancies except on the Paris Transport Authority, the Cambodian Railways, and the Syrian State Railways.

Promotion for workmen depends on their capacity and ability, rarely on seniority, and it is exceptional for a workman to become a member of the clerical staff. Promotion of clerical staff is dependent on ability. Seniority is a secondary consideration.

Vacancies in administrative and technical posts, as well as in executive grades, are filled either from existing staff or by outside recruitment. Many railways employ both methods, but vacancies for which university qualifications are required are filled from outside. Some form of examination or test is usually applied to existing staff to estimate their suitability for promotion. The approval of their immediate superiors is also required.

Apprentices

Some railways have schools which train apprentices for various trades. The age limits vary from 14 to 18 years and priority is given to the children of employees. Instruction is given in daytime classes, or, occasionally, by correspondence courses. No railway has organised evening classes. School training is followed by practical training. The emphasis is on turning out good tradesmen in the first instance rather than executive staff. On all railways apprentices are given priority when appointments are made to the permanent staff.

All the railways reported that medical examinations are obligatory, whether for permanent or temporary staff. Staff concerned with safety, drivers, and machinists, are often required to pass periodical examinations.

A standard of fitness has been laid down by most of the railways and a thorough medical overhaul is insisted upon for permanent staff. Examinations for temporary staff are less rigorous. Railways frequently employs full-time medical officers and, if necessary, the advice of specialists is sought.

Replacement

The rate of replacement varies from one per cent to six per cent, but the policy everywhere is to reduce the staff considerably. The age of retirement varies from 60 to 65 for sedentary staff and from 50 to 55 for staff required to travel. Voluntary retirement is possible at the ages of 55 to 60, and 45 to 50 for the respective classes, but a minimum period of service is usually required.

The distribution of staff by age groups shows that on nearly all railways there is too low a percentage of young employees and a very high percentage of employees nearing retirement. Generally, the largest age group is from 36 to 50. This reflects the considerable decline in recruiting during recent years.

None of the administrations proposes a revision of recruiting methods but some are studying possible modifications of their present methods.

In summing up their report, the authors conclude that a policy which results in only two groups of employees, one young and one reaching retirement age, is bad. It is likely, in the long run, to cost more than it has saved.

XUM

Power Signalling at the Approaches to East Croydon

Two power signalboxes, containing 238 levers, have replaced six mechanical boxes with 390 levers, and control the triangular junctions between Norwood, Selhurst and East Croydon

ON March 21, 28 years after the opening of its first section of multiple-aspect colour-light signalling between Blackfriars and Holborn, the Southern Region brought the same method of working into use in the Norwood Junction-Selhurst-East Croydon area, on the main lines from London Bridge and Victoria to Brighton, bringing its total route mileage of this type of signalling to 124½, with a track mileage of 435.

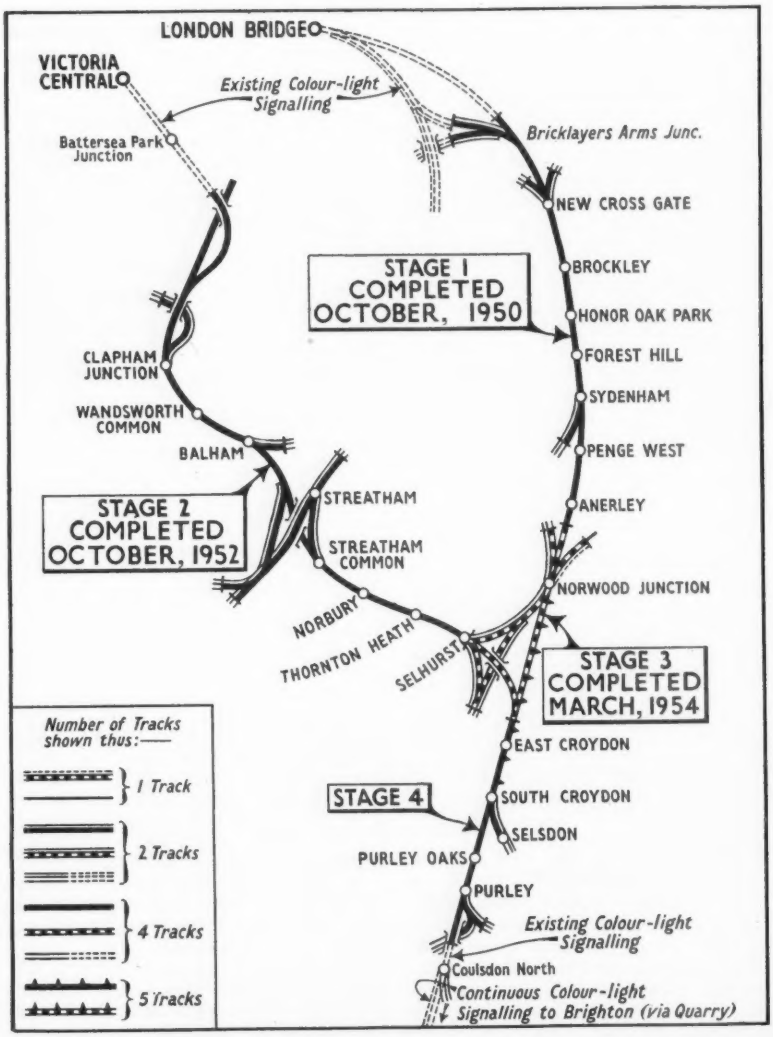
This latest installation marks the third stage of a four-stage scheme, and completes colour-light signalling between London and the East Croydon approaches as part of a scheme to make such signalling continuous all the way to Brighton. The fourth stage will consist in closing the gap between the present work and Coulsdon, and is scheduled to be finished next year. The second stage was described in our October 17, 1952, issue.

New Power Signalboxes

The new signalboxes are Norwood Junction, containing a 107-lever frame and replacing two of mechanical type containing 155 levers, and Gloucester Road Junction, with a 131-lever frame, replacing four mechanical boxes totalling 235 levers. The junctions in the area, some of the flyover type, are involved and the increased centralisation of control will greatly facilitate the operation of large numbers of suburban trains and those between London and South Coast towns.

The layout controlled from the new boxes covers 4¾ route miles, or 17¼ track miles, but includes only six automatic signals because of the closeness and frequency of the junctions. Stage 4 will include a new signalbox at East Croydon, which will take the place of the existing North and South boxes. The structure has been built already to house some relay equipment involved in the present work and controlling the operation of the North box. This will facilitate the change when Stage 4 comes to be completed. The design of the new boxes is the same as that adopted in power signalling of recent years by the Region, with relay room below the operating room, and accumulator, stores and staff rooms in the winged extensions.

The Mechanical & Electrical Engineer's 3-kV. three-phase 50-cycle ring main signalling supply equipment chambers are also incorporated in the box layout. Gloucester Road Junction is a three-storey building to reduce length and enable the signalmen to see over the through lines, about 8 ft. above the box ground level.



Stages in the colour-light signalling scheme on the Central Section, Southern Region

Lever Frame Details

The power frames follow Southern Region practice and have individual levers with electric interlocking. Each lever has two lock magnets, one for the interlocking, the other for track and indication locking. All signal levers have normal indication backlocks, but no front normal selection locks. Each point lever has normal and reverse track locks, all four aspects of a signal are repeated behind its lever, and both running and shunt signal levers have an "F" light indication, illuminated when the signal can be cleared by reversing the lever. The position of points is given by illuminated "N" and "R" signs behind the relevant lever. The usual illuminated track diagrams are provided.

The relay rooms house the main transformers, fuses, rectifiers and all the control apparatus on which safe operation depends. The main signalling supply is 480 V. into the relay room from the Mechanical & Electrical Engineer's portion of the box. Local distribution is at 110 V., but all automatic signal and other major locations are fed at 480. The 600 controlling relays in the various rooms are on steel racks, convenient for observation, testing and changing. The fuse and cable terminal panels, also of steel, are up to 24 ft. long, and each fuse panel carries 500 to 700 fuses. One hundred miles of flameproof wire have been

used in the signalboxes and relay rooms.

Train Describers and Telephones

There are 16 transmitting and 16 receiving magazine train describer instruments for communicating between the signalboxes in and at the approaches to the area, with indications covering the first, second and third trains approaching a location. The indications are stepped up automatically as each train is dealt with by a signal box. Each box is in telephonic communication with signals, adjacent boxes and the Traffic Control. The telephone positions are duplicated when necessary to enable the booking lads to deal with calls. All automatic and most controlled type signals have train crew telephones with direct separate circuit communication to the box concerned.

Outdoor Equipment

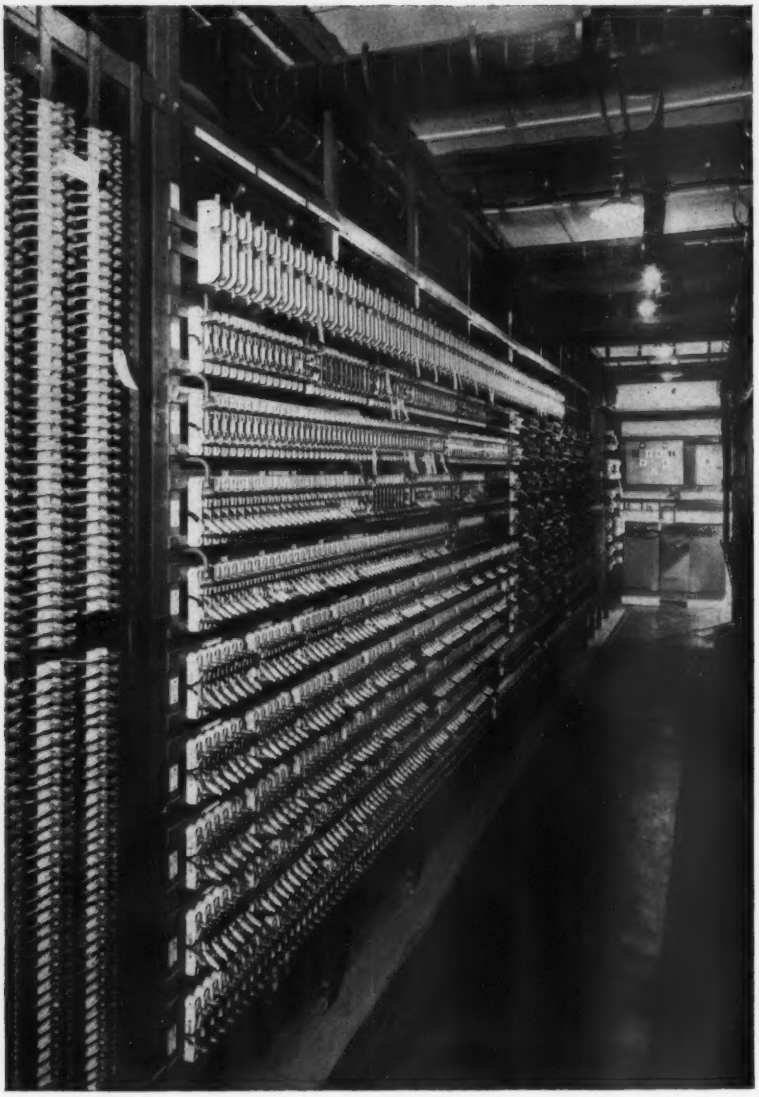
There are 80 long range multiple-aspect signals and 23 junction indicators, so spaced and track-circuit controlled as to afford a 2½ min. headway for stopping trains, with 36 floodlit disc shunting signals, solenoid operated. The lightweight steel signal bridges were designed and erected by the Civil Engineer, but the straight tubular posts with gallery were designed by contractors to the requirements of the Signal & Telecommunications Engineer, whose staff erected them. There are 110 point machines, most operated at 120 V. from trickle-charged accumulators at the signalboxes, with standby rectifiers for direct operation. There are 175 single and double rail condenser fed track circuits with 114 impedance bonds. As far as possible the track relays are in the signalboxes, local controller rooms or in the apparatus cases at automatic signal locations.

The cable route is almost throughout surface concrete troughing, of which there is approximately 10 miles. Signalling cables are multicore V.I.R. lead sheathed, protected and served, the number of conductors varying from 10

The 131-lever power frame, with illuminated diagrams and train describers at Gloucester Road Junction signalbox

New signalbox at Norwood Junction, replacing former North and South boxes containing 155 mechanical levers

New signalbox at Gloucester Road Junction, replacing four mechanical type boxes totalling 235 levers



Fuse, power, and terminal panel in relay room, Gloucester Road Junction

to 40. There are approximately 750 core miles of signalling cable, 80 pair miles of telephone cable, dry-core lead sheathed and S.W. armoured, and seven miles of oil impregnated paper insulated lead sheathed S.W. armoured twin feeder cables for 480 v. and 110 v. distribution.

Changeover

This important installation was designed and carried out by the Signal & Telecommunications Engineer's Department. The change from the old to the new was effected within a 6½-hr. possession. Over 160 signal arms and fittings and many posts and dolls had to be abolished, while 110 sets of points were disconnected from the old signal boxes and attached to the electric machines previously installed and tested; nearly 600 men, drawn from all over the London area of the Department were required. There were also some 60 from the Operating Civil Engineer's, and Mechanical & Electrical Engineer's Department.

The principal contractors were:—

Signalling apparatus
Westinghouse Brake & Signal Co. Ltd.
Siemens & General Electric Railway Signal Co. Ltd.
Metropolitan-Vickers General Railway Signal Co. Ltd.
Siemens Bros. & Co. Ltd.
Tubewrights Limited
W. R. Sykes Interlocking Signal Co. Ltd.
Nife Batteries Limited
Permali Limited

Cables
Hackbridge Cable Co. Ltd.
Johnson & Phillips Limited
General Electric Co. Ltd:
W. T. Glover & Co. Ltd.
Siemens Electric Lamps & Supplies Co. Ltd.
W. T. Henleys Telegraph Works Limited
St. Helens Cable Co. Ltd.
Edison Swan Electric Co. Ltd.

NEW CLUB PREMISES AT HERTFORD.—New club premises for the Hertford Branch of the Eastern Region Staff Association, on the ground floor of Hertford North Old Station, were opened on March 3 by Mr. C. S. McLeod, Regional Staff Officer, Eastern Region. Councillor W. V. Proctor, J.P., Station Master, Hertford East and Hertford North, presided at a dinner to mark the event, at which the Mayor of Hertford, Alderman P. Brookes, J.P., was present. Mr. McLeod, as Chairman of the Regional Council, Eastern Region Staff Association, unveiled a plaque on the premises to commemorate the opening.

RECONSTRUCTION OF SHEFFORD STATION.—Shefford Station, on the former Midland Railway Bedford-Hitchin line, and opened over 96 years ago, is now in course of reconstruction by the London Midland Region of British Railways. It is expected that the work will be completed by the end of next May. Two new 190-ft. platforms of serviceable sleepers are being constructed. The trestles, fencing, and lighting poles are being provided from suitable timber recovered from Carpenders Park station, which is now being completely rebuilt. The main station buildings, of precast concrete units, will face the High Street on the west side of the line, and embody ticket and parcels offices, porters' room, and toilets. The existing building on the down platform will be replaced by a new shelter.

SAUNDERS VALVE EXHIBITS AT THE B.I.F.—Exhibits of the Saunders Valve Co. Ltd., at the forthcoming British Industries Fair at Castle Bromwich, will include 7-in., 9-in. diaphragm valves for various fluids, abrasives, and corrosives, and 5 in. pressure opening valves. Examples of the new ebonite valves, diaphragm valves with ebonite bodies, in ¼ in., ½ in., 1 in., 1½ in., and 2 in., both screwed and flanged types, suitable for laboratories and chemical factories, where a completely non-corrodible valve is essential, will also be exhibited. Other exhibits will include a range of Safran centrifugal pumps in eight sizes adapted for special purposes by the introduction of a series of multi-stage and vertical trunk pump models, and the automatic self-priming Reflux pumps with a Villiers petrol engine power unit, together with a Unishaft close-coupled unit for handling dirty water, including small solids, delivering 3,480 g.p.m. at 20-ft. head. The pump is available in three sizes 1½ in., 2½ in., and 3 in.

CLYDE FERRIES AND THE COWAL COAST.—Mr. L. E. Marr, Manager of the Clyde Shipping Services, recently presented a free ticket for the conveyance of the 2,000th vehicle by British Railways' new car and vehicle ferry vessel, the m.v. *Arran*, since entering operation at the beginning of January. The value of the service in opening up the Cowal Coast is now obvious and an increasing number of vehicles is being conveyed as the service becomes better known and appreciated. At first, some 70-80 vehicles a week were carried but the numbers have now reached 300 a week, even in the quiet winter months. In the summer period demands on the ferry will increase considerably, and the service is to be increased and a Sunday service arranged on and from Sunday, April 18.

British Built Goods Engines for Spanish Mines

Designed to haul a load of 350 *tons at* 5 *m.p.h. on a* 2 *per cent grade*

THE locomotive illustrated is one of six supplied by Robert Stephenson & Hawthorns Limited to the Rio Tinto Co. Ltd. for their mines in Spain. The engines are of the 2-6-0 type, and are designed to haul loads of 250 tons at ten m.p.h. and 350 tons at five m.p.h. on a two per cent. grade.

The boiler is of the Belpaire type with welded inner firebox and steel tubes and is fitted with superheater equipment. Boiler mountings include the Vacuum Brake Company's 19 mm. SJ (P) type combination ejector with combined steam break valve, Ross pop safety valves, Klinger KD type water level gauges, Everlasting blow-down cock, Gresham & Craven self-acting under footplate type injectors.

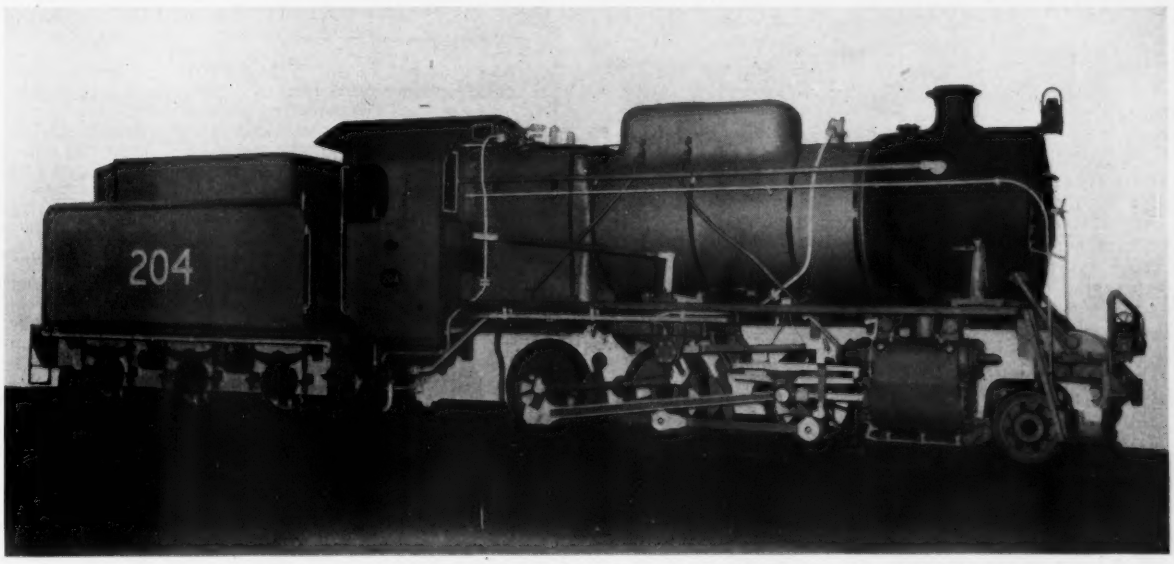
Asbestos mattresses are fitted for boiler insulation and the hopper type ashpan is carried on the locomotive main frames. This is fitted with a part drop-grate for cleaning purposes and the usual drencher gear. A combined self cleaner and spark arrestor is provided in the smokebox.

Engine Particulars

The cylinders and steam chests are lubricated from a Wakefield Eureka four-feed sight-feed lubricator. Valve motion is that of the Walschaerts type. The locomotive frames are of steel plate and manganese liners are fitted to horn guides and axleboxes. The leading truck spring suspension is compensated with the leading coupled wheel springs. The tenders are of the six-wheeled type with self-trimming bunker, tank and bunker being of riveted construction. The locomotives have been designed to meet the requirements of the Rio Tinto Co. Ltd. and inspection was carried out by Mr. R. H. Inness.

The leading particulars are as follow:—

Gauge	3 ft. 6 in.
Cylinders (2)	17 in. dia. × 24 in. stroke
Wheels, coupled	3 ft. 6 in. dia.
Wheelbase, total	17 ft. 9 in.
Boiler pressure	200 lb. per sq. in.
Weight in working order	51·5 tons
Tractive effort at 85 per cent boiler pressure	28,074 lb.
Tender:	
Wheels	3 ft. dia.
Wheelbase	9 ft. 6 in.
Capacity of tank	3,100 gal.
Fuel capacity (coal)	5·5 tons
Weight in working order	33·5 tons
Total weight of engine and tender in working order	85 tons
Total length of engine and tender	47 ft. 5 in.



Goods locomotives built by Robert Stephenson & Hawthorns Limited for operating at the Rio Tinto mines

ROTATION SWITCHES FOR CONVEYORS.—New weatherproof rotation switches introduced by the General Electric Co. Ltd. have been designed for use with conveyors and other material handling equipment to prevent the piling up of goods in the event of a breakdown or partial stoppage. A switch of this type attached to the layshaft of a conveyor can be wired into a relay circuit controlling the motor of the preceding conveyor, so that it automatically switches out that motor in the event of its own conveyor stopping or running too slowly. In a series of conveyors, each equipped with this device, a chain reaction back to the beginning of the feed could be initiated. Two patterns of switch, one for breaking and the other for making circuit, are available. They incorporate mercury switches carried in cradles free to swing independently against light pressure, and moved by two cams. It is necessary for the switches to remain stationary in either the break or make position (according to type) for 3-5 sec. before they make or break the circuit. This may be brought about either by a conveyor stopping or going at a speed below that desired. Unlike centrifugal switches, which need the use of gears if a low-speed shaft is the operating member, rotation switches will operate satisfactorily between 25 and 50 r.p.m., which is the speed range of the average conveyor layshaft or idler. The switches are covered by British Patent Application 11529/51.

IMPROVEMENTS IN IRISH SERVICES, LONDON MIDLAND REGION.—A new named express called the "Shamrock" will be introduced on June 14 by the London Midland Region, leaving Euston at 4.55 p.m. daily (Mondays to Fridays) to connect with the Belfast and Dublin steamship services from Liverpool. It will return from Liverpool at 8.10 a.m. each day. The "Ulster Express" is to be accelerated. Leaving Euston at 6.20 p.m. instead of 4.55 p.m. as now this train will give an 85 min. quicker journey from London to Belfast Donegall Quay via Heysham.

DEVELOPING THE EXPORT TRADE.—At a weekend conference at Ashorne Hill, near Leamington, arranged by the British Institute of management in conjunction with the National Union of Manufacturers, the Federation of British Industries, and the Institute of Industrial Administration, the need was urged for more personal contact with overseas buyers and better display facilities for British goods. One speaker advocated the immediate construction of a permanent exhibition financed by the Government, where the products of small manufacturing firms could be shown to overseas visitors.

Modern Station Practice in the Netherlands

Basic considerations in design; use of both concrete and brick

Exterior of new station at Flushing

MANY station buildings in the Netherlands have had to be rebuilt as a result of destruction or damage during the war and the new designs adopted show considerable variety. The frequency of services made possible by the extension of electric and diesel traction has greatly influenced their planning and layout.

A feature comparatively new in Dutch practice is the centralisation of ticket control at the entrance and exit. The ideal arrangement is a booking hall at street level with subway and stairways to the platforms. The hall is spacious but not very high, and the number of access doors is restricted. In view of the shortness of waiting periods, full restaurant facilities are rarely found, though small buffets are more common.

Booking offices in the new stations are equipped with a Swiss design of ticket rack, which is horizontal and nowhere higher than the counter, so that the view of the clerk is not hampered. The tickets are stored horizontally in the racks; they are arranged round the clerk in a fan shape and are recessed into the top of his table. The passenger places his money on a rotatable disc, on which also he receives his ticket.

Reinforced Concrete Construction

In the construction of a number of the new stations reinforced concrete has been used, another new feature in Dutch station design. Only here and there has any attempt at colour effect been made by the addition of brick dust, ground sandstone, or dye. Many of the parts are prefabricated in the factory; the rest are cast locally. By sandblasting the concrete its structure is clearly revealed. At the corners, narrow, sharp-finished sides of smooth concrete are left. A fine example of concrete, steel and glass construction is the station at Enschede, described in our February 16, 1951, issue; others in this form are at Hengelo, Zutphen, Leyden, and Arnhem, the last-mentioned still under construction.

Use of Brick

There is a strong tradition of brick building in the Netherlands, and the new stations at Gouda, Flushing, Hook of Holland, and s'Hertogenbosch do justice to the good local brick. Nijmegen Station and the new Central Station at Rotterdam are also being built of brick.

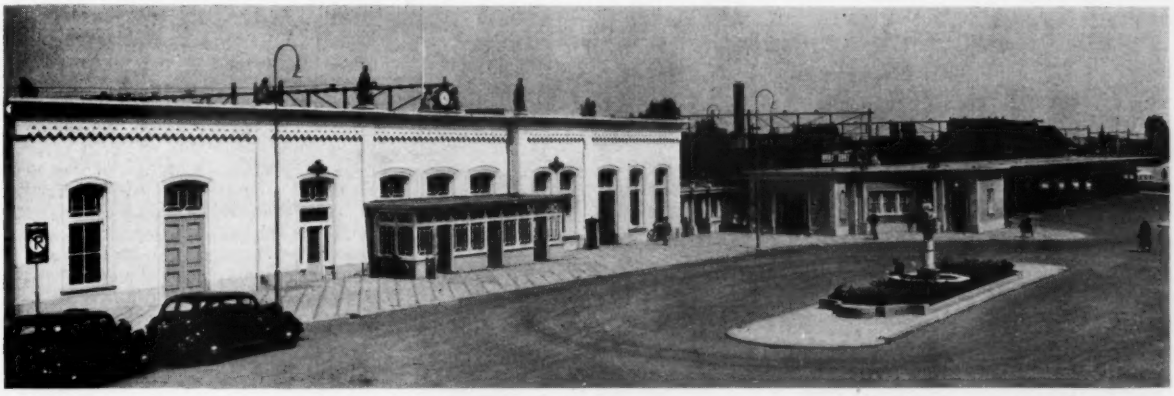
The building of new stations is accompanied mostly by the re-design of the road approaches, to improve the flow of traffic. Opportunity is often taken to provide loading platforms for buses, many of which are operated by ancillary road transport undertakings of the Netherlands Railways. These platforms are so sited that passengers can transfer from train to bus without crossing a thoroughfare.

Modernised booking hall of the H.S. station at The Hague

TAPERED ROLLER BEARINGS IN ROLLING MILLS.—British Timken Limited has produced a 16 mm. film entitled "Tapered Roller Bearings in Rolling Mills," which shows how these bearings are manufactured and the care taken to ensure that the precision built into them by the company enables the steelmaker to maintain great accuracy in his products. The film was shown for the first time at the Savoy Hotel on March 16, when Mr. S. E. Graeff, Director of the Steel Company of Wales and of Richard Thomas & Baldwin Limited, paid tribute to it on behalf of the guests. It is available for showing anywhere in the world; there is a French version and a German version will be ready soon.

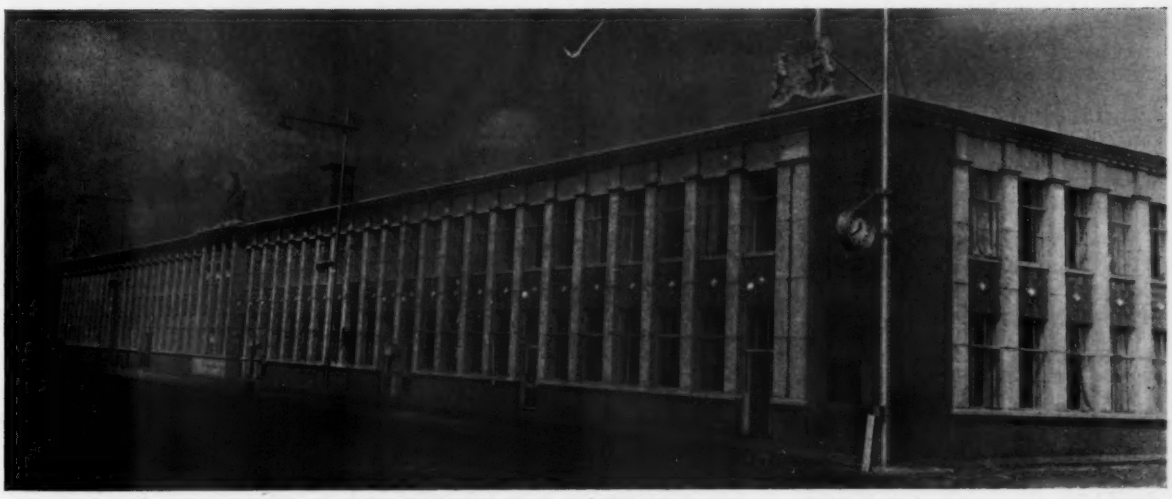
VERSATILE INDUSTRIAL COMPRESSOR UNIT.—Designed to achieve the maximum efficient working life with minimum attention and maintenance, a pedestal-mounted compressor unit, the 200 SAS, is now in quantity production by the Hymatic Engineering Co. Ltd., Redditch. With a displacement of 5·25 c.f.m. at 750 r.p.m. and a working pressure of 100-150 p.s.i., the 200 SAS may be incorporated as initial equipment or as an optional extra on tractors, special vehicles, machine tools and powered plant for such duties as spray painting, pneumatic greasing, the operation of pneumatic tools, jigs and fixtures, and other compressed air applications. When necessary the unit may also be operated at 1,000 r.p.m. to give a displacement of 7 c.f.m. against a working pressure of 100 p.s.i. The single 200 c.c. capacity, high-duty cast-iron cylinder, bore 2·67 in. and stroke 2·16 in., is of the single-stage type heavily finned, so that with the finned-cast aluminium cylinder head and the ample inlet and outlet ports, a consistently low delivery temperature is maintained.

Modern Station Practice in the Netherlands



New station at Gouda, showing loading platforms for associated road services vehicles on right

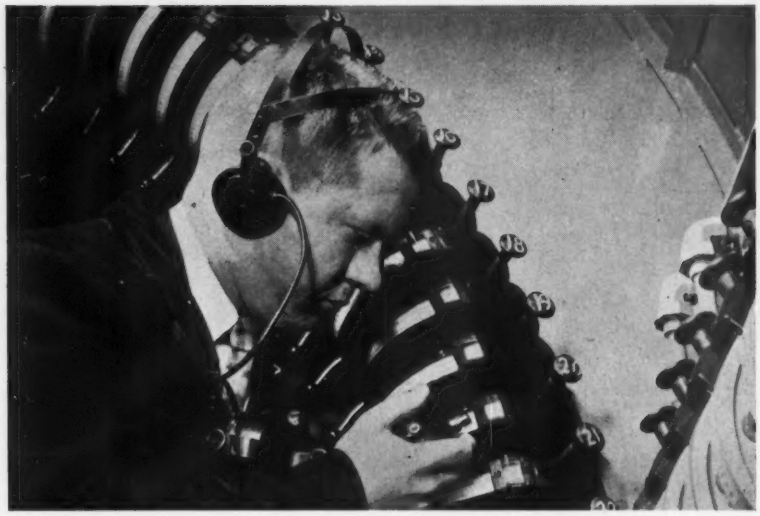
An example of modern brick construction: the important junction of s'Hertogenbosch



The rebuilt station at the Hook of Holland, also largely built of brick

Pennsylvania Railroad Clearance Car

Measurement of lineside structures by antennae



An operator, wearing telephone headset, reading profile measurements from the instruments inside the clearance car

THE Pennsylvania Railroad has introduced a specially designed car for the measurement of track clearances. Accurate information of this type is constantly required to decide whether bulky out of gauge loads such as turbo generators, transformers, and bridge sections, increasing traffic in which is being carried, will pass. The car is believed to be unique and was built at the Pennsylvania Railroad's Altoona works at a cost of over $250,000. It is usually made up into a short train consisting of a locomotive, the clearance car, and a crew coach. The car has now been in service for three years.

Aluminium rods, 3 ft. long, and steel tipped, project from the sides and roof of the car in the form of an arch. As the train moves slowly towards a structure to be measured the rods are brushed backwards by contact to conform to the contours of the structure. A system of cables and gears transfers the deflection of each rod to a magnified dial inside the car. The rods, 126 in number, are each capable of giving readings to $\frac{1}{8}$ in.

Profile Recording

The front section of the car contains the series of dials and is manned by two operators who pass the dial readings back to a recording room in the rear of the car. Communication is by two-way loudspeakers and headphones. In the recording room a draughtsman, who is also in charge of the car, plots the information on graphs as it is read out to him. These graphs show the profile and clearance of the structure measured. At the headquarters of the Pennsylvania Railroad in Philadelphia these individual graphs are correlated and the information incorporated into charts and manuals for the guidance of freight and permanent way departments. The whole of the 28,511 miles of track are covered in this way.

The clearance car can cover an average of 100 miles of track each day. The time taken for measurement is about five minutes for a bridge and 30 min. for a tunnel a mile long. Portions of track presenting the greatest clearance problems are measured every six months and other lines from once each year to once in five years. Frequent inspection is needed on some sections of track because the centrifugal force of a high-speed train may cause rails to creep towards the outside of a curve for a distance of as much as three inches. Similarly, a section of line may be raised slightly to improve drainage, or badly drained track may lift as much as five inches when frozen hard. Any such movement as this will reduce a clearance already tight to a point where some bulky loads will no longer pass.

As a result of the work of this car, clearances are constantly being improved. Three years ago $9,000,000 was spent in eliminating four tunnels and widening a fifth on a 37-mile stretch of track west of Steubenville, Ohio. This resulted in an average of two days saving in journey time for bulky loads and extra-large box cars between Pittsburgh and St. Louis, Cincinnati, and Louisville.

Crew Accommodation

The car also contains quarters for its crew of four men. These are in the centre of the car and consist of a kitchen, dining room, bedroom, fitted with four bunks, and lounge. The kitchen is finished in stainless steel and the fourth member of the crew, a general utility man, also acts as cook.

The car is normally idle in winter, when the crew assist in the work of converting their field measurements into diagrams at the Philadelphia office. Other administrations, lacking suitable facilities of their own, may hire the clearance car from the Pennsylvania Railroad on a rental basis.

The Pennsylvania Railroad's clearance car emerging from a tunnel. The aluminium arms can be seen brushed back to conform to the profile of the structure

RAILWAY NEWS SECTION

PERSONAL

At the annual meeting of the Mansion House Association on Transport on March 26, Mr. M. F. Barnard, M.Inst.T., was elected President & Chairman of the Council.

Mr. R. D. Armstrong, Associate Comptroller, Canadian National Railways, has been appointed Comptroller, succeeding Mr. T. J. Gracey, who retired on March 31.

Mr. A. T. Fussell, Assistant Publicity & Advertising Manager, New Zealand Railways, has been appointed Publicity & Advertising Manager for the system.

Mr. T. B. Andison

Secretary & Registrar, Ulster Transport Authority, 1936-1954

Mr. T. B. Andison, F.C.I.S., M.Inst.T., Secretary & Registrar of the Ulster Transport Authority, who, as recorded in our March 12 issue, is retiring at the end of March, was born in County Dublin, where his parents, who came from Scotland, had settled. He received his earlier education in Dublin, Navan and Belfast, later going to Galway Grammar School. In 1912, he joined the staff of the former Belfast & County Down Railway in the Audit & Accountants' departments, rising eventually to the position of Chief Assistant to the Accountant. He held this position until his appointment as Stores Superintendent of the company in 1920, in addition to which, in 1925, he also took over the position of Registrar. In January, 1936, after the retirement of Mr. H. E. Mellor, he was appointed Secretary & Accountant, which position he held until the railway was transferred to the ownership of the Ulster Transport Authority on October 1, 1948, when he was appointed the first Secretary & Registrar of the Authority. Mr. Andison is a Fellow of the Chartered Institute of Secretaries, and is also a past Chairman and a Vice-President of the Northern Ireland branch of that Institute. He is also a member of the Institute of Transport, which he has served as its Northern Ireland Treasurer since 1944. He has played a large part in the various reorganisations which have taken place in Northern Ireland transport in recent years, including the co-ordination measures called for by the pre-war Transport Act of 1935 and the merger of the former Road Board, the Belfast & County Down Railway and the Northern Counties Railway since the war by the Act of 1948.

Mr. Ronald E. B. Lee, Comptroller of Accounts & Audit of the Western Australian Government Railways, has been appointed Assistant Commissioner (Commercial) on the Western Australian Government Railways Commission, succeeding the late Mr. P. C. Raynor, whose death was recorded in our November 6 issue.

Mr. J. G. T. Anderson

Appointed Secretary to the Ulster Transport Authority

Mr. J. G. T. Anderson, F.C.I.S., A.M.Inst.T., Deputy Secretary & Registrar, Ulster Transport Authority, who, as recorded in our March 19 issue, has been appointed Secretary to the Authority, was born in Stewartstown, County Tyrone, and educated at Cookstown Academy. In 1928, he joined the firm of H. M. S. Catherwood Limited, where he was first employed in the Traffic Department. In 1931 he was transferred to the Secretary's department of that company, where he qualified as a Chartered Secretary, having passed the intermediate and final examinations of the Chartered Institute of Secretaries. He was admitted an Associate of the Institute in 1935. When the Northern Ireland Road Transport Board was set up in 1935 and took over most of the omnibus and lorry undertakings then operating in Northern Ireland, Mr. Anderson was appointed Assistant Secretary & Registrar of the Board, which position he held until the undertaking of the Board was, with the County Down and Northern Counties railways, merged in the Ulster Transport Authority in 1948, when he became Deputy Secretary & Registrar of the Authority. In 1937, Mr. Anderson was admitted to the further degree of Fellow of the Chartered Institute of Secretaries and has served the Northern Ireland Branch of that Institute as Honorary Secretary from 1937 till 1943, and since then as a member of the Northern Ireland Branch Council of the Institute.

Mr. A. P. Sarkar, Deputy Financial Adviser & Chief Accounts Officer, Eastern Railway, India, who, as recorded in our March 19 issue, has been appointed Financial Adviser & Chief Accounts Officer of the Ganga Bridge Project at Mokameh, is the Project's first Financial Adviser & Chief Accounts Officer. Mr. Sarkar was born on July 29, 1899. Having graduated a Master of Arts, he joined the Bengal & North-Western Railway in 1923. Within six years of service, he was promoted to be Assistant Auditor on the Bengal & North-Western and Rohil Khund & Kumaon railways, which position he held

Mr. A. P. Sarkar

Financial Adviser & Chief Accounts Officer, Ganga Bridge Project, Mokameh

until December, 1942. From January, 1943, to May 7, 1945, Mr. Sarkar was Senior Accounts Officer on the Oudh & Tirhut Railway. From May 8, to August 25, 1946, he was on the East Indian Railway from where he went to the Bengal Assam Railway as Deputy Chief Accounts Officer. On August 15, 1947, he became Deputy Chief Accounts Officer, Assam Railway, and, on July 1, 1948, he was transferred to the Madras & South Mahratta Railway as Deputy Chief Accounts Officer. On July 23, 1949, Mr. Sarkar returned to the East Indian Railway as its Deputy Financial Adviser & Chief Accounts Officer and remained there until April 13, 1952. On regrouping, he was posted to the Eastern Railway as its Deputy Financial Adviser & Chief Accounts Officer. Mr. Sarkar, who was appointed to his new position on September 2, 1953, was responsible for the introduction of departmental running of the Cash & Pay Organisation on the Oudh & Tirhut Railway and the setting up of the accounts organisation on the Assam Railway on disintegration of the Bengal Assam Railway in 1947.

Mr. Alex H. Hart, Assistant Solicitor, Canadian National Railways, has been appointed Special Assistant in the Traffic Department of the company.

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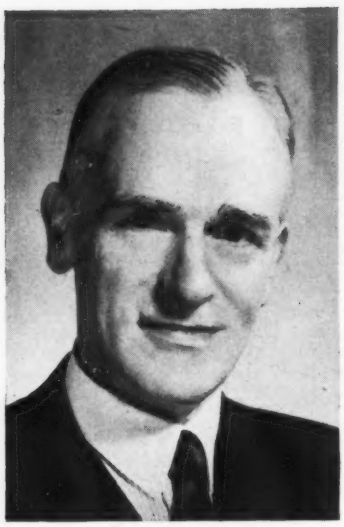

Mr. H. G. Bowles

Principal Assistant to Chief Regional Manager, Western Region

Mr. C. Furber

Commercial Superintendent, Western Region, 1948-54

Mr. A. C. B. Pickford

Appointed Commercial Superintendent, Western Region

Mr. H. G. Bowles, Assistant Chief Regional Officer, Western Region, British Railways, who, as recorded in our March 12 issue, has been appointed Principal Assistant to the Chief Regional Manager, Western Region, entered the service of the Great Western Railway in the Goods Department at Paddington in 1913. Three years later, he was transferred to the Reading district. After seven years general experience, including a period of training in the Traffic Department, he was in 1923 appointed to the General Manager's office, where he had extensive experience of the major questions arising from the administration of the railway and its ancillary and associated undertakings, and of several Government and other inquiries affecting transport. In 1941, Mr. Bowles became head of the section which covered, among other matters, railway and dock rates and charges, rolling stock and stores, statistics and accounts, and road and rail co-ordination. In April, 1946, he was appointed Chief Clerk to the General Manager, and, following nationalisation of the railways, Assistant to the Chief Regional Officer, Western Region. In May, 1949, Mr. Bowles became Acting Assistant Chief Regional Officer and, in January, 1950, he was confirmed in that appointment.

Mr. C. Furber, M.Inst.T., Commercial Superintendent, Western Region, British Railways, who, as recorded in our March 26 issue, retired on March 25, has completed nearly 50 years of service. He joined the former Great Western Railway in 1904 in the London District Goods Manager's Office, and ten years later was transferred to Southall Goods Station. In 1916, he was promoted to the General Manager's Office, where for ten years he acted as personal clerk to the General Manager and undertook a number of special duties, including staff investigations, and was associated with proceedings conducted by the Railway Rates Tribunal appointed under the Railways Act, 1921, to deal with charges and so forth. In 1926, Mr. Furber became Assistant to the London District Goods Manager, and, in 1930, he was appointed Chief Clerk to the Chief Goods Manager and Secretary to the G.W.R. Goods Conference. He subsequently represented the G.W.R. at functions in France connected with the company's cross-channel business, and, in 1933, was appointed Mineral Traffic Manager with responsibilities for the development of freight train traffic generally. During this period, Mr. Furber was Chairman of the Mineral Manager's Conference of the Railway Clearing House for a number of years and, during the 1939-45 war, served on the Mines Department Trans-

Mr. H. H. Basford

Appointed District Motive Power Superintendent, Wellingborough, L.M. Region

Mr. W. B. S. Miller

Appointed District Engineer, Hull, N.E. Region

Mr. Douglas I. Grant

Appointed Executive Assistant, Canadian National Railways

port Committee. Among other bodies on which Mr. Furber represented the G.W.R. were the Continental Traffic Manager's Committee, the Continental Section of the United Kingdom Chamber of Shipping, the Advisory Committee of Traders & Railways dealing with questions affecting the distributive coal trade and the Transportation Committee of the London Chamber of Commerce. After assuming the responsibilities of Chief Goods Manager in 1947, Mr. Furber became Commercial Superintendent of the Western Region of British Railways in January, 1948, the position he now vacates. He has, for a number of years, been Chairman of the Winter Transport Committee of the British Transport Commission and of the Great Western Athletic Association, and a Director of the Birmingham & Midland Motor Omnibus Co. Ltd., the Western Welsh Omnibus Co. Ltd. and the Fishguard & Rosslare Railways & Harbour Company.

Mr. A. C. B. Pickford, until recently Executive Officer (Terminals) of the Railway Executive, who succeeds Mr. Furber as Commercial Superintendent of the Region as from March 29, entered the service of the Great Western Railway Company in 1915. After obtaining experience at stations and District Offices in South Wales, he was appointed to the Staff Department at Paddington as an Outdoor Investigator, in 1929. Appointed Personal Secretary to the Chief Goods Manager in 1932, he became Goods Agent at Slough in 1934. On Mr. Pickford's return to Paddington in 1937, he became a Member of the Commercial Research Department, and represented the Great Western Railway on liaison committees with the Ministries of Food and Supply; also on the Freight Rolling Stock Centralised Committee. In 1941, he was appointed Rates Assistant (Research) to the Chief Goods Manager, and in 1943, District Goods Manager at Swansea. Transferred to Cardiff as District Goods Manager in 1945 he was, in 1947, appointed South Wales Area Assistant to the Chief Goods Manager, and, on the formation of the Railway Executive in 1948, he returned to London as an Executive Officer of that body, being Chairman of the Terminals Committee. A Member of the Council of the Institute of Transport, and of the Council of Institute of Materials Handling, Mr. Pickford was leader of a team of traders and transport interests which visited America in 1950, with special reference to freight handling. Mr. Pickford was also a Member of the Winter Transport Conference and represented British Railways on the International Union of Railways and the International Container Bureau.

Mr. H. H. Basford, M.I.Loco.E., Assistant to Divisional Motive Power Superintendent, Derby, London Midland Region, British Railways, who, as recorded in our February 26 issue, has been appointed District Motive Power Superintendent, Wellingborough, was educated at the Derby Technical College, where he was awarded the Sir Henry Fowler prize for engineering. He began his railway career in 1913 when he joined the Midland Railway as an apprentice at Derby Works. After the cessation of 1914-18 war, during which he served in the Royal Naval Air Service, Mr. Basford returned to Derby and gained experience in the locomotive and drawing offices and spent a year as a railway inspector at contractors' works. He was appointed Draughtsman to the Superintendent of Motive Power of the L.M.S. on the formation of the system in 1923 and, after several years in this position he became Head Office Inspector (Technical) to the Divisional Superintendent of Motive Power, Midland Division. In 1935, he became Assistant District Motive Power Superintendent, Derby, and, in 1948, he was appointed Assistant to Divisional Operating Manager (Motive Power), Derby, responsible for maintenance, the position he now leaves for his new appointment.

Mr. W. B. S. Miller, B.A. (Eng.), (Cantab.), Assistant District Engineer, Doncaster, North Eastern Region, British Railways, who, as recorded in our March 12 issue, has been appointed District Engineer, Hull, was educated at Haileybury College and Emmanuel College, Cambridge. He joined the service of the L.N.E.R. as a graduate pupil in 1933. Up to the outbreak of the 1939-45 war he was employed in the Area Engineer's offices at York, Edinburgh, Kings Cross, and the District Office at Stanningley. Mobilised in August, 1939, he proceeded overseas with the 150th Railway Construction Company R.E. in September, and served with this and other railway construction units throughout the war, commanding No. 1212 Railway C. & M. Group in Italy, and later No. 3 Group in North West Europe. He was awarded the M.B.E. in 1943 for service in Italy, was demobilised in 1945 with the rank of Lieutenant-Colonel, and returned to his pre-war railway employment in the Maintenance Section of the Civil Engineer's Office at Kings Cross. He was appointed Chief Assistant (Maintenance) in 1947; in March, 1949, he became Assistant District Engineer, Boston; and in December, 1951, Assistant District Engineer, Doncaster. Mr. Miller has occupied his Hull post since October 5, 1953.

Mr. Douglas I Grant, Secretary, Canadian National Railways, who, as recorded in our March 19 issue, has been appointed Executive Assistant, brings to his new position a wide knowledge of railway affairs. He graduated from Osgoode Law School in 1926, and, after serving with a law firm in Toronto, joined the C.N.R. as solicitor in 1930. A son of the late Hon. Justice David Inglis Grant, Justice of Appeal of the Supreme Court of Ontario, he was made a King's Counsel in 1946. He moved to Montreal as Assistant Secretary of the system in 1948, and was appointed Secretary of the railway and its subsidiary companies in 1950.

Mr. Samuel D. Sneddon, Manager of Stores, Canadian National Railways, has retired.

At an extraordinary general meeting of United Railways of the Havana & Regla Warehouses Limited held on March 4, the company was placed into members' voluntary liquidation, and Mr. W. R. Tomkinson, T.D., F.C.A., and Mr. R. H. B. Wright, F.C.I.S., were appointed Joint Liquidators.

Monsieur Dorges, formerly Director General of Railway & Transport at the Ministry of Public Works & Transport, France, has been appointed Honorary General Secretary of the Ministry and has been officially delegated the responsibility for international relations in the transport field. Monsieur Dorges has already undertaken valuable work in this sphere; he is the French representative on the O.E.E.C. Transport Commission, President of the Commission of Transport Experts for the European Coal & Steel Community, French deputy at the European Transport Ministers' Conference and the French representative on the Inland Transport Committee of Economic Commission for Europe. Monsieur André Dounenc, a Technical Adviser to the Minister of Transport since 1950, succeeds M. Dorges as Director General of Railways & Transport.

Mr. Albert Edward Record who, as recorded in our March 12 issue, has been confirmed in the joint position of Staff Assistant to the Mechanical & Electrical and Carriage & Wagon Engineers, London Midland Region, Derby, British Railways, left Hastings Street Higher Grade School (now the Central School) Derby, in 1914 to enter the service of the Midland Railway at Derby. Apart from Army service and five years from 1934 to 1939, when the headquarters of the former Chief Mechanical Engineer's department of the L.M.S. were located at Euston, all his service has been at Derby. Mr. Record has had a variety of experience on matters affecting the staff of the Mechanical & Electrical and Carriage & Wagon Engineers' departments totalling 40,000 staff and is a Management Side Representative on various Regional Sectional Councils and Committees of Negotiation for settlement of staff problems in conjunction with representatives of the staff. He has, since November 1949, been a member of the local Advisory Committee set up by the Minister of National Insurance for considering and advising the Minister on any special local problems bearing upon the Act. Mr. Record has been acting in his present capacity since December, 1952.

Colonel K. R. N. Speir, Honorary Secretary of the Transportation Club, retired from that office as from March 31. He is succeeded by Captain St. John Cronyn. The Chairman of the Club, Mr. K. W. C. Grand, presided at a luncheon of members of Council on Monday last, to mark the occasion of Colonel Speir's retirement. Mr Grand, Major-General G. S. Szlumper, Past-Chairman, and Mr. T. W. Royle, previously Acting-Chairman of the Club, all paid tribute to the long and selfless service Colonel Speir had rendered to the Club since its inauguration and expressed the indebtedness of the Council and Members to him.

At a Council Meeting subsequently a resolution conferring Honorary Life Membership on Colonel Speir was unanimously approved with acclamation.

Mr. David D. Frank has been appointed Director of Public Relations, Montreal Locomotive Works Limited.

Mr. E. R. McClung, Assistant Manager, Ordnance Plant, Schenectady, American Locomotive Company, has been appointed Assistant Plant Manager, Dunkirk, N.Y.

Mr. Arthur E. Skan, a Director of the Ellison group of companies, Tufnol Limited, George Ellison Limited, and Alfred Ellison Limited, has been elected Chairman of the British Plastics Federation.

Mr. G. E. Cater has been appointed General Sales Manager of Tecalemit Limited. He has recently returned from India where he was a Director & General Manager of Tecalemit (India) Limited, and Tecalemit (Pakistan) Limited, and Deputy General Manager of the managing agents Heatly & Gresham Limited.

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Mansion House Association Annual Luncheon

Sir Brian Robertson on railway freight charges; need for a period of stability

The annual luncheon of the Mansion House Association on Transport was held at the Trocadero Restaurant, London, on March 26.

Mr. Alan Lennox-Boyd, Minister of Transport & Civil Aviation, proposing the toast of the Mansion House Association on Transport, said he recognised the part played by the Association when freedom in charging for the railways was under discussion in 1953 as part of the Transport Bill. The Association had recognised that rail transport was still essential. Last year the net ton-miles carried by British Railways were 40 per cent above prewar. The good sense shown by the Association at that time would be reflected in the years that lie ahead.

He had asked Sir Brian Robertson to leave the Army, in which his interests lay, to take charge of the biggest industrial army in the world as Chairman of the British Transport Commission. Sir Brian Robertson had readily accepted and had inspired all grades of railwaymen by his leadership.

Capital for Reorganisation

Mr. M. F. Barnard, Chairman of the Mansion House Association on Transport, in his reply thanked Mr. Lennox-Boyd for the 1953 Act. Freedom for the railways in charging meant, he said, that traders were now in a unique position. If the Commission's scheme for reorganisation of the railways needed money, the Government should make the money available.

On disposal of the B.T.C. road haulage assets, Mr. Barnard thought there should be a new pattern; he would expect such units to be offered as to enable the prewar system to return. Traffic flows should be left intact.

As regards the B.T.C. freight charges scheme, this should give details of maximum charges and the Commission then should quote commercial rates. The interest lay in the commercial rates, not in the maximum charges.

Mr. L. G. Burleigh, a Member of the Council of the Association, proposing the toast of "The Guests," referred to the long history of the M.H.A. and said that, given a reasonable period of stability, the B.T.C., by providing the services needed, could become prosperous.

Sir Brian Robertson said in his reply that the Association was primarily representative of transport users, and whatever charges were made the user would think them too high, but increases were necessary as a result of rising costs. Transport charges certainly could not be increased without serious detriment to the country's economy. The trades unions had been asked to co-operate and he was confident that they would. Great economies could and must be made without detriment to efficiency and without a drastic policy of staff dismissals. The freight charges policy would be announced soon, but it would not be a panacea. It would introduce a scale of maximum charges. Actual charging would be a result of arrangements to be made with customers.

"Every large commercial undertaking working on private capital," Sir Brian Robertson added, "has freedom to fix its charges, but every sensible organisation observes a very considerable degree of consistency in its charging policy since any other course would infuriate its customers and drive them into the lap of its competitors."

Exactly the same considerations must operate in their case. It was not their job to discriminate in favour of some customers at the expense of others. It had been decided that public transport should work in a competitive climate, and the Commission must act accordingly. The new scheme also would remove many anachronisms and anomalies, but its purpose was not to reduce overall revenue.

"Nineteen-fifty-four is going to be a very difficult year for us," he went on. "Our costs are rising. We shall have to struggle very hard to make ends meet. We may not do it, but I can assure you that we intend to do our utmost in that regard. It will be a very serious day when, if ever, it is admitted that the B.T.C. must go on the dole."

A period of stability was needed, he continued. Road and rail were in transition, but he hoped that a more stable period would result with better service to the public. The B.T.C. was the servant of the public and it had the right of the master to tell the servant if he was not getting the service he required. There was plenty that was wrong with the nationalised transport service, though much good, devoted work was going on every day. If an occasional word of encouragement was never given the rank and file of the organisation would conclude that they were regarded as slackers and that it was of no use trying to make people believe differently. He thanked the Association for the friendly reception given to him and to all the guests.

Others present included:

Mr. E. W. Arkle, Sir John Benstead, Mr. C. K. Bird, Sir Cyril Birtchnell, Mr. W. Blakey, Mr. D. Blee, Wing Commander E. E. Bullus, Messrs. H. R. Caulfield Giles, F. G. Crabb, C. G. G. Dandridge, G. Wynne Davies, Sir Charles Goodeve, Messrs. K. W. C. Grand, F. Grundy, Ian Harvey, T. H. Hollingsworth, C. P. Hopkins, Hubert Hull Messrs. E. S. Hunt, A. J. Malacrida, A. E. U. Maude, W. H. F. Mepsted, R. Morton Mitchell, Messrs. S. E. Parkhouse, A. C. B. Pickford, J. R. Pike, Major J. C. Poole, Messrs. G. W. Quick Smith, H. G. N. Read, D. Renton, Messrs. H. E. Sanderson, A. E. Sewell, G. F. Sinclair, H. S. Vian Smith, J. W. Watkins, Viscount Waverley.

Underground Railway in Toronto Opened

Ceremonial inauguration of Yonge Street Subway, the first facility of its type in Canada

The Yonge Street Subway of the Toronto Transit Commission was officially opened on March 30 by Mr. Leslie M. Frost, Prime Minister of Ontario. The line runs for some 4½ miles in cut-and-cover beneath or in cutting close to Yonge Street, the main north-south artery, from a terminus adjoining the Union Terminal to Eglinton Avenue.

It is laid to the 4 ft. 10⅞ in. gauge, that of the city tramways, but has been designed and constructed for operation by underground railway stock, which has been supplied by the Gloucester Railway Carriage & Wagon Co. Ltd., as described in our January 8 issue. Other British manufacturers have been prominently associated with the work, as was pointed out in that article and is also apparent from the list of guests which concludes this report.

The main ceremony took place at Davisville Station, the last before Eglinton on the open section of the line. Others officially taking part were:—

Toronto Transit Commission

Messrs. William C. McBrien, Chairman; J. A. Scythes, Vice-Chairman; W. G. Russell, Commissioner; Chas. A. Walton, Commissioner; Clive M. Sinclair, Commissioner; W. E. P. Duncan, General Manager; and H. E. Pettett, Secretary.

Sir Leslie Boyce, Managing Director, Gloucester Railway Carriage & Wagon Co. Ltd.; the Rev. C. H. Bentall; Mr. F. G. Gardiner, Chairman, Toronto Metropolitan Council; Mr. Allan A. Lamport, Mayor of Toronto.

After short speeches by Messrs. McBrien, Lamport, and Gardiner, the Rev. C. H. Bentall invoked a blessing on the line and its operation.

Mr. Leslie M. Frost expressed his great honour and pleasure at giving Canada its first subway. He then pushed forward a control handle setting a light to green and symbolising the opening of the railway.

Inaugural Train

The first train, conveying guests, moved north to Eglinton, crossed to the southbound track and traversed the length of the subway to Union Station, where a plaque was unveiled by Mr. Leslie M. Frost. Luncheon was offered at the Royal York Hotel. The line was opened to the public at 1.30 p.m.

Others present included the following guests:—

Mr. A. Avison, General Manager, David Brown & Sons (Huddersfield) Ltd.; Colonel S. H. Bingham, Chairman, New York City Transit System; Messrs. F. L. Castle, General Manager, Siemens & General Electric Railway Signal Co. Ltd.; C. E. DeLeuw, De Leuw Cather & Company, Chicago; N. L. Hibbs, United Kingdom Trade Commissioner; Alan Johnson, Taylor Bros. & Co. Ltd.; F. B. March, David Brown & Sons (Canada); Sir Archibald Nye, United Kingdom Trade Commissioner; Messrs. H. G. Oldham, United Kingdom Trade Commissioner; F. W. Sinclair, Chief Designer, Gloucester Railway Carriage & Wagon Co. Ltd.; C. Leslie Smith, General Manager, Gloucester Railway Carriage & Wagon Co. Ltd.; J. Sulston, Signal Engineer, Siemens & General Electric Railway Signal Co. Ltd.; A. B. B. Valentine, Vice-Chairman, London Transport Executive.

ANTOFAGASTA (CHILI) & BOLIVIA RAILWAY CO. LTD.—A dividend of 2½ per cent has been announced on the £2,000,000 5 per cent preference stock of the Antofagasta (Chili) & Bolivia Railway Co. Ltd. This is on account of arrears to June 30, 1946. The last dividend on the £6,400,000 consolidated ordinary stock was four per cent for 1930.

York Railway Lecture & Debating Society Jubilee Dinner

The Jubilee Dinner of the York Railway & Debating Society was held on March 16.

The first meeting of this Society was held on the evening of November 1, 1904, under the presidency of Sir George Gibb, General Manager, North Eastern Railway; as far as is known the only similar railway organisation with such a long history is the Paddington Lecture & Debating Society, which is a month or two senior to its York counterpart.

Mr. H. A. Short, Chief Regional Manager, North Eastern Region, presided at the dinner, which was attended by some 135 persons, including Mr. J. C. L. Train, Member, British Transport Commission; Mr. C. M. Jenkin-Jones, former Divisional General Manager, North Eastern Area, L.N.E.R.; Mr. T. F. Cameron, Chief Regional Manager, Scottish Region; Mr. E. W. Arkle, Commercial Superintendent, London Midland Region; also past and present officials, four founder members and representatives from the Paddington Lecture & Debating Society and from societies in the North Eastern Region.

Messages of goodwill and regrets at inability to be present were read from Sir Ralph Wedgwood, a former Chief General Manager of the L.N.E.R. and first Chairman of the York Society, and from Mr. C. P. Hopkins, Chief Regional Manager, Southern Region, formerly Chief Regional Officer of the North Eastern Region, and a Past President.

Importance of Debating Societies

Mr. Train proposed the toast to "The York Railway Lecture & Debating Society." He referred to his past association with its first Chairman, Sir Ralph Wedgwood, and referred to the famous railwaymen who served in the North East during the past 50 years. He congratulated the society on its choice of subjects for past debates. A debating society, he said, was a means of free self-expression for all grades of staff, especially the younger members. He emphasised the importance of continuing this policy.

Other speakers were Mr. T. F. Cameron; Mr. O. G. Ward, Assistant Regional Staff Officer, Western Region; Mr. A. Dean, Civil Engineer, North Eastern Region; and Mr. J. E. Richardson, District Commercial Superintendent, York.

Comfort in Pullman Cars

Many passengers have experienced discomfort, especially in cold weather, when occupying a seat next to a door which is constantly being opened and closed. Annoyance is caused by the draught experienced by the operation of the door and also by the metallic clicking of the door latch.

To reduce as far as possible this annoyance and discomfort, the Pullman Car Co. Ltd. is experimenting in moving the door from a position near such seats to the far end of the coupé corridor, where the noise of a closing door will not be noticed, and has substituted for it a heavy velvet curtain mounted on a swinging bracket.

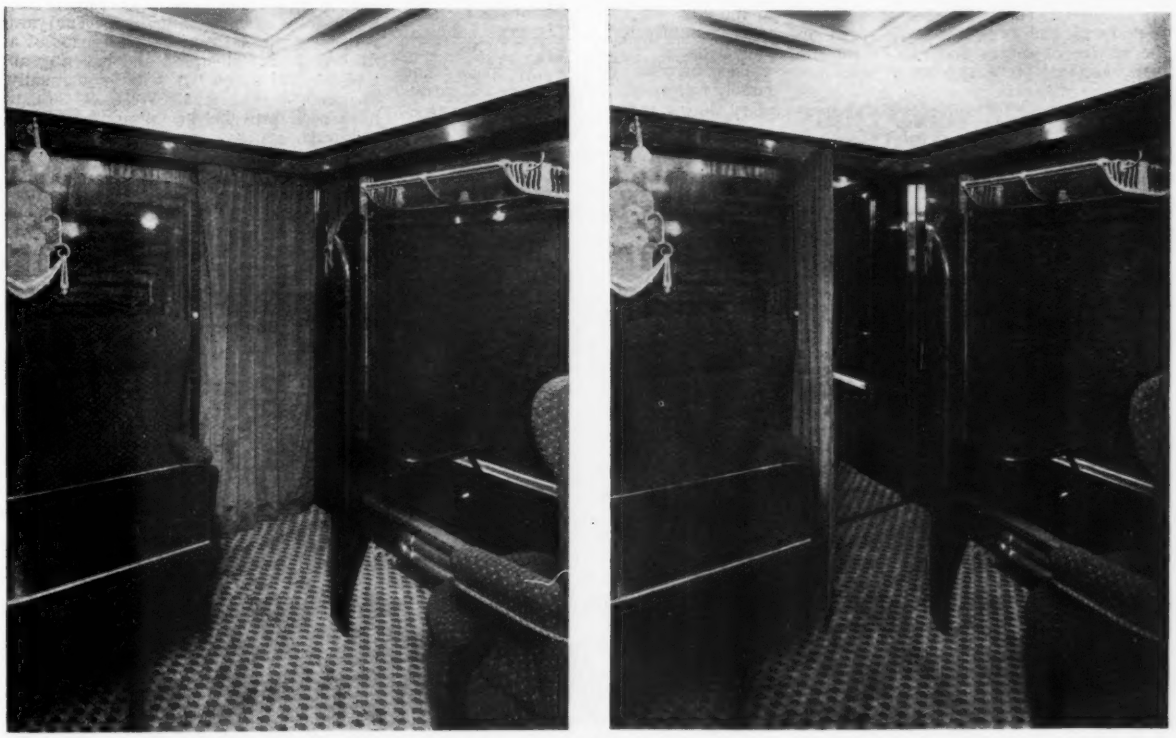
The curtain can be adjusted by the person occupying the seat near the doorway, either to close the doorway gap, as shown in the illustration on the left, or to swing it round close to the chair as shown on the right. The latter position also makes it possible for attendants to move easily to and fro through the door opening without inconvenience to the passenger.

English Electric Co. Ltd.

The annual meeting of the English Electric Co. Ltd. was held on March 17. Sir George H. Nelson, Chairman & Managing Director, who presided, said that a further substantial increase in both production and turnover fully justified the additional manufacturing facilities already in operation and the further extensions in hand. Orders in the books ensured the maintenance of the 1953 volume in 1954, but while home orders in 1953 exceeded those of 1952, competition from overseas manufacturers caused the volume of export orders to fall.

The issued share capital now stood at £13,252,037 and the loan capital at £9,041,206. The net trading balance, before taxation, was £4,779,920 compared with £4,359,034 in 1952, an increase of 9·6 per cent.

As to the future, he believed that if efforts were maintained, the economic position of the country could continue to improve. The energetic pursuit of scientific research and imaginative application of the results must be continued. There was a responsibility of management and workpeople alike which could be aided by a Government fiscal policy which progressively reduced the burdens of personal taxation. This would provide incentives which in turn would bring savings for investment in new industrial enterprises. Saving out of personal incomes had not exceeded 2 per cent in this country in any year since the war. Sir George Nelson went on to speak of the part played by the company in traction developments during 1953. He said that a notable achievement had been the development of the first 50-cycle single-phase railway equipment built in this country. The system employed rectifiers supplying standard direct current traction motors, and three complete motor coach trains provided



(Left) Curtain in Pullman car drawn across aperture, from which the door has been removed to far end of coupé corridor; (right) curtain swung close to chair, giving easy access for attendant

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by British Railways had been equipped. Since August, 1953, these have been in regular service on the Lancaster-Morecambe-Heysham line. The performance of these trains, he stated, equalled that of the latest types of equipment operating on direct current. When this line was originally electrified in 1908 at 6,600 V., 25 cycles, two of the three original motor coach equipments were supplied from the Stafford works of the English Electric Company, formerly owned by the Siemens Company.

The traction production for the year included 25 streamlined passenger or freight 2,400 h.p. electric locomotives with rheostatic braking for the Victoria Government Railway, Australia, which were giving satisfaction in service.

In the diesel-electric field 10 locomotives of 1,500 h.p. powered by the company's 12SVT engine were shipped to the Queensland Government Railways and were working between Brisbane and Cairns, a run of 1,000 miles in each direction.

In the course of his report Sir George paid tribute to the work of the Export Credits Guarantee Department with which the company had worked closely since its inception. He also welcomed the formation during the past year of the Commonwealth Development Finance Co. Ltd. as a source of assistance in financing overseas business in suitable cases.

Modernised Refreshment Room at London Bridge

Since nationalisation in 1948, £250,000 has been spent on the modernisation of station refreshment rooms throughout British Railways. The latest room to be dealt with is situated on the Central Section side of London Bridge Station, Southern Region. This has been completely re-designed and re-equipped to speed up the service of drinks and snacks for the many hundreds of City workers who use the room daily.

The new equipment includes pedal-operated electric beer engines, a hot-dog cooker, and a glass-washing machine; additional floor space has been obtained by re-designing and re-siting the long bar counter.

The colour scheme is pink and cream with woodwork in light walnut. The bar and table tops are of stain- and heat-resisting material and the floor is of plastic tiles for easy cleaning. Ventilation is by 10 air extractor fans placed behind attractive ceiling lights. A notable feature is an electric calendar-clock, the first of its kind to be used in a refreshment room on British Railways.

The refreshment room was extensively damaged during the war, but has been kept in continual use during the temporary repairs and the recent period of reconstruction.

Re-equipped refreshment room on Central Section side at London Bridge, Southern Region, showing calendar clock; air extractor fans are arranged behind ceiling lights

New Approach Lines at Bulawayo

A £1,000,000 scheme to improve working at this important traffic centre

Traffic on the Rhodesia Railways has been increasing for many years, particularly since the war. Train miles run in the years 1952-53 were 73 per cent more than those run in 1945-46. This has caused considerable congestion at the main centres, specially at Bulawayo, where the three main routes, to the Union of South Africa, Northern Rhodesia, and eastward to Beira via Salisbury, converge. In view of this, the Rhodesia Railways are carrying out an important development scheme to improve the flow of traffic through the Bulawayo area.

The main part of the scheme is the re-siting of the eastern (Salisbury) approach line to bring all traffic in from a westerly direction, by means of a 14-mile deviation line through the northern outskirts, joining the line from Northern Rhodesia and from the south at M'popoma. This will create a terminal station at Bulawayo and by means of a large marshalling yard at M'popoma will enable through traffic to be sorted and marshalled without entering the station area. It will also allow five level-crossings to be abolished on the east side of the city, where, because of the increase in road traffic, they have become potential danger spots.

The original eastern approach line largely follows the contours, as was customary during the era of African construction in which it was built, but the new line has been constructed with a ruling gradient of 1 in 80, and a maximum curvature of 22 ch. This has meant building considerable earthworks and excavating large cuttings, involving the movement of over 250,000 cu. yd. of material. There are also four underbridges spanning rivers, one of 100 ft. span, two of 50 ft. span, and one of three spans of 20 ft. Seven new overbridges built to carry main roads over the line are of ferro-concrete construction, cast in situ; the river bridges are steel.

The formation has been designed to carry two tracks, though at first a single line only will be in operation. When the second track is brought into use, the 14 miles of double-track will be the first example of double-line working in the Rhodesias. It will be signalled on the absolute lock-and-block system with colour-light signals.

New Yard, Sidings, and Shed

In conjunction with the deviation scheme are the M'popoma Yard, the Westgate Sidings and a new running shed. The yard will be of the flat type with 53 roads of a total length of 20 miles, and covering an area of 170 acres. It will be manually operated. The small Westgate Sidings have been provided at the approaches to Bulawayo station, to afford accommodation for holding traffic from the south for Bulawayo.

The new running shed, costing approximately £300,000, includes a mechanical coaling-plant, ash disposal plant, and a 95-ft. turntable to facilitate the turning of Beyer-Garratt locomotives. It is the first turntable to be installed in Rhodesia. There are also extensive inspection pits with fluorescent lighting, a wheel dropping area, a machine bay, and the usual offices, stores and locker rooms. The total area is 36 acres, and there is ample provision for an increase in the shed area.

The scheme was begun in November, 1950, and it is hoped that all works will be completed early in 1955 at an overall cost, excluding the running shed, of approximately £1,000,000.

ROAD ACCIDENTS IN FEBRUARY.—Fewer people were killed or seriously injured on the roads in February than in the same month last year. Provisional figures compiled by the Ministry of Transport show that deaths numbered 256, a decrease of 89, and the seriously injured, 2,984, a decrease of 396. The number of slightly injured rose by 214 to 9,575, bringing the total to 12,815.

Staff & Labour Matters

Railway Workshop Staff

A further meeting of the Railway Shopmen's National Council took place on March 26 to consider the claim of the employees' side of the council for improved rates of pay for railway shopmen.

The employers' side made an offer to the union representatives with a view to reaching agreement on the claim. The offer was not disclosed, but it is being considered by the executives of the N.U.R. and C.S.E.U. who represent the railway workshop staff on the Council.

Engineering Wage Claim

The Engineering & Allied Employers' National Federation have advised the C.S.E.U. that they are not prepared to increase the offer of a 5 per cent increase in rates of pay of men employed in the outside engineering industry. Another meeting has, however, been arranged, as the employers have stated that they are willing to listen to any fresh facts which the unions may have to state.

Ministry of Labour Arbitration Proposals

An article by Mr. J. S. Campbell, General Secretary of the N.U.R., in the *Railway Review* for March 26, sounds a note of warning on the arbitration and other proposals arising from the suggestions made by the court of inquiry appointed to deal with the wages dispute in the engineering industry. The court had suggested an authoritative and impartial body to consider the wider problems concerning the national economy.

Mr. Campbell suggests that the trade union movement as a whole should take careful stock of its position before accepting something which might have very detrimental effects on its rights and freedoms. He refers to the N.U.R.'s experience in the recent wages negotiations and favours a cautious attitude to the suggestion for voluntary arbitration as distinct from machinery such as courts of inquiry or the Railway Staff National Tribunal, which are recommending bodies whose decisions are not final and binding on any of the parties.

He contends that the arbitration courts during 1953 followed a very decided pattern, and 32 per cent of the awards were in the region of 4s. a week. Mr. Campbell states that had the N.U.R. in December, 1953, accepted the policy of arbitration which involves both sides agreeing to abide by the findings of the arbitrators, the union would have been bound to accept an increase of 4s. a week in full settlement of its application. The main complaint of railwaymen would not have been answered, that their wages have lagged behind those in industry generally.

On the suggestion that an impartial body should be set up to advise on the effect of wage increases on the national economy, Mr. Campbell states that acceptance of this suggestion brings in its train the inevitable result of a national wages policy, an issue which has been debated at length and rejected by the trade unions. He can see no advantage, at least for railwaymen, because they would have to accept that the existing wage and salary structure was satisfactory and could only be varied if a committee, such as had been suggested, could advise in favour of a general wage increase.

Parliamentary Notes

Machine Tool Deliveries

The Parliamentary Secretary to the Ministry of Supply (Mr. A. R. W. Low) said in the House of Commons on March 18 that a total of 18,618 machine tools had been ordered, as part of the defence effort, from overseas. Of these, 6,224 were from the U.S.A. or Canada. Those from the U.S.A. came with the financial help of the Government of the U.S.A. The remaining 12,394 were coming from Europe. By the end of 1953, all but 630 had been delivered, and these should arrive by June this year. The total cost was estimated at slightly more than £116,000,000. No further orders under this centralised scheme had been placed since March, 1953. Prices from overseas had risen by an average of over 20 per cent since the orders were placed.

Forth Road-Rail Bridge

Mr. Alan Lennox-Boyd, Minister of Transport & Civil Aviation, stated on March 24 that he had received the report of the panel which he had set up to inquire into Sir Bruce White's proposal to convert the present Forth bridge into a road-rail bridge. The panel found that it was "difficult to see any sufficient justification for the project." He agreed with this finding and had told the B.T.C. that it could now proceed with improvements to the ferry service at Queensferry. A formal indemnity had been given to cover the risk of capital loss if and when a road bridge is built.

Questions in Parliament

Forth Bridge Railway Accident

Mr. Hector Hughes (Aberdeen N.—Lab.) asked the Minister of Transport & Civil Aviation on March 24 for a statement on the Forth Bridge railway accident.

Mr. Alan Lennox-Boyd replied that a formal inquiry had been held. The express concerned failed to negotiate a steep gradient, moved backwards, and the last three coaches were derailed at catch points. There were no serious injuries and the damage to the rolling stock and the track was not severe. One passenger received a slight injury. He was awaiting the report of his Inspecting Officer of Railways on the whole matter.

Rail and Air Accident Rates

Mr. J. D. Profumo (Joint Parliamentary Secretary to the Ministry of Transport & Civil Aviation) replying to a question put on March 24 by Mr. Ronald S. Russell (Wembley S.—C.) said that the fatality rate on regular services of British airlines for the five-year period to March 13, 1954, was 3·7 passengers killed per hundred million passenger-miles. The figure for British Railways for five years to December 31, 1953, was 0·35.

Contracts & Tenders

British Railways, Eastern Region, have placed a contract with the Churchill Machine Tool Co. Ltd., Manchester, for the supply and delivery of three vertical spindle surface grinding machines for Gorton Locomotive Works.

British Railways, North Eastern Region, have placed orders as follows:—

Wilkins & Mitchell Limited, Darlaston: provision of tool plate assembly and die blocks for Forgemaster "N" press at Shildon Wagon Works

Aveling-Barford Limited, Grantham: four road rollers for District Engineers at York, Darlington, Leeds, and Hull

The Metropolitan-Vickers Electrical Co. Ltd. is to supply to the Central Railway of Brazil for its Rio de Janeiro suburban services 100 motor coaches and 100 trailers complete and 100 sets of electrical equipment for coaches to be built in Brazil. The order is valued at about £7,000,000. The lines are of the 5 ft. 3 in. gauge, electrified at 3,000 V. d.c. The stock will run in conjunction with existing stock supplied by Metropolitan-Vickers.

An order valued at more than £4,000,000 has been placed with Wm. Denny & Bros. and Harland & Wolff Limited for three ships for the London Midland Region Heysham-Belfast route. Each ship will convey 1,800 passengers (300 more than the present vessels) and will be fitted

British Railways Locomotive Quiz Competition

Mr. F. A. Pope, Member of the British Transport Commission, presenting the challenge shield to the captain of the Barry (Western Region) team, winners of the British Railways Locomotive Quiz Competition

with stabilisers. There will be an enclosed promenade deck running the whole length of the third class passenger accommodation. The new vessels, which will be driven by turbine machinery and will be oil fired, will replace the three "Duke" ships which have been on the route for over 25 years.

The Special Register Information Service, Board of Trade, Export Services Branch, states that the United Kingdom Trade Commissioner at New Delhi has reported that the Directorate-General of Supplies & Disposals, Government of India, is calling for tenders for the supply of 36 items of points and crossings.

The closing date for receipt of tenders is 10 a.m. on April 14. Tenders should be addressed to the Director-General of Supplies & Disposals, Shahjahan Road, New Delhi.

A set of the tender documents, including conditions of contract and drawings, is available on loan to United Kingdom firms in order of application to the Branch at Lacon House, Theobalds Road, London, W.C.1.

Notes and News

Traffic Training Officer Required.—Applications are invited for the post of traffic training officer, railway department, required for the Gold Coast Local Civil Service for two tours each of 18 to 24 months in the first instance. See Official Notices on page 395.

Vulcan Foundry Limited Dividend.—The directors of the Vulcan Foundry Limited have declared a dividend of 5 per cent on the 5 per cent cumulative preference stock for the half-year ended December 31, 1953. The dividend is subject to tax at 9s. in the £ and is payable on March 31 to stockholders registered on March 20.

Institution of Civil Engineers: Railway Paper No. 53.—On Tuesday, May 11, Railway Paper No. 53, "Wear of steel rails: a review of the factors involved," by Mr. J. Dearden, will be delivered before the Institution of Civil Engineers at Great George Street, Westminster, S.W.1, at 5.30 p.m.

Davies & Metcalfe Limited.—The annual meeting of Davies & Metcalfe Limited is to be held on April 12 at Romiley, Cheshire. The trading profit for 1953 was £60,571 compared with £66,097 for 1952. To this is added sundry income £666 (£749). The net profit was £18,639 (£22,861). A dividend of 20 per cent (same) has been announced. Current assets totalled £195,258 (£192,159). Current liabilities were £50,662 (£51,244).

British Railways International Rugby.—A French rugby fifteen from l'Association Sportive Préparation Olympique will visit this country and play the Great Western Railway (London) XV at their ground at Castle Bar Park, Ealing, tomorrow (April 3). In recent years the G.W.R. fifteen has made two visits to France to play matches against the Riberac and Angoulême Rugby Clubs as well as against a team from l'A.S.P.O. at Tours. For the match at Ealing, the French team arrives in London today, when an official reception is being held at Paddington Station, followed by dinner in the West End of London and a sightseeing tour. Before travelling to Castle Bar Park tomorrow, wreaths will be laid on the War Memorial at Paddington by the captains of the French and British teams. A dance will be held in the Club Pavilion after the game. On Sunday the French side will meet the London Transport Executive (Railways) fifteen in a match on their Osterley ground, and return to Paris by the "Night Ferry" the same evening.

Institute of Transport: Informal Luncheon.—The Institute of Transport will hold an informal luncheon on Tuesday, April 27, at the Connaught Rooms, Great Queen Street, W.C.2, at 12.30 for 1 p.m. The address will be given by Sir Gilmour Jenkins, President-Elect.

Historical Model Railway Society.—On Monday, May 10, Mr. George Dow, Public Relations & Publicity Officer, British Railways, London Midland Region, will give a talk entitled "Railway photographs from my collection" to the Historical Model Railway Society, at the Headquarters of the Stephenson Locomotive Society, 32, Russell Road, London, W.14, at 7 p.m.

British Railways Coal, Iron, and Steel Traffic.—British Railways carried 3,269,070 tons of deep-mine and opencast coal last week, including 399,430 tons cleared in the 48 hr. ended 6 a.m. on March 29. During the week ended March 20, 227,187 tons of iron and steel from the principal steelworks and 344,200 tons of iron ore were conveyed, compared with 214,950 tons and 334,300 tons in the corresponding week last year.

Tilbury Line Civil Engineering Works: Normal Working Resumed.—Train services on the London, Tilbury & Southend line will revert to normal from April 5. In February, the time taken by trains between London and Southend had to be increased by up to five min. for essential engineering work preliminary to electrification. This restriction is now being removed. Other engineering work at present in hand is being dealt with so as not to upset train working.

Sir Brian Robertson in Liverpool.—Sir Brian Robertson, Chairman of the British Transport Commission, presided at an informal dinner party to representatives of the civic and industrial life of Liverpool at the Adelphi Hotel, Liverpool, on March 26. As the Lord Mayor of Liverpool was unable to be present, Alderman Albert Morrow responded to the toast "The City of Liverpool," which had been proposed by the chairman. Sir Brian Robertson was supported by representatives of British Railways, British Road Services, and the Docks & Inland Waterways Board.

Institute of Traffic Administration: Annual Conference.—The annual conference of the Institute of Traffic Administration will take place from May 7 to 9, at the Prince of Wales Hotel, Southport. On Friday, May 7, at 8.30 p.m., the annual general meeting will be held, followed at 9.30 p.m. by a reception by the Chairman of the Council. On Saturday, May 8, at 9.30 a.m. a series of short discussions will take place led by practical traffic administrators on "A survey of today's traffic problems." In the afternoon at 2 p.m. there will be a coach tour including the Overhead Railway, Mersey Tunnel, and part of Wirral. In the evening a reception by Lord Merrival of Walkhampton, President of the Institute of Traffic Administration, will take place at 7 p.m., followed at 7.30 p.m. by the annual dinner. On Sunday morning, May 9, at 9.30 there will be a meeting of the National Council.

Brush Group Sales Conference.—The biennial sales conference of the Brush Group will be held at Wadham College, Oxford, on April 7-10; it will be attended by more than 50 directors and executives from all over the world. The purpose is to give the home directors the opportunity of discussing their present and future manufacturing and sales programme with the representatives of the Group's associated companies overseas and with their travelling executives.

Permanent Way Institution, London Section: Visits to Toton Marshalling Yards.—By the courtesy of Mr. L. P. Ball, Divisional Operating Superintendent, London Midland Region, Derby, arrangements have been made for a limited number of members of the Permanent Way Institution to visit the Toton Marshalling Yards, near Nottingham, on Saturday, May 8 and 15. Each party will leave St. Pancras Station at 9 a.m. for Nottingham. The return journey will be by the 6.15 p.m. train from Nottingham (Victoria) Station due at Marylebone Station at 9.20 p.m.

Easter Trains in the North-Eastern Region.—British Railways, North Eastern Region, are arranging 172 relief trains and 174 special cheaper fare excursions for the Easter holiday. Eighty-eight relief trains will run into the Region. Excursions will include 111 to the seaside, of which 30 run to Scarborough, 28 to Blackpool, and 19 to Morecambe; 17 between inland towns; and 22 to race meetings. Reliefs to timetable trains will include 85 to London and to Scotland; 32 to Lancashire and the North-west; and 35 to the Midlands, South Coast, and West of England.

Three New Ships for Heysham-Belfast Route.—Greater comfort will be provided for passengers on the Heysham-Belfast route of British Railways, London Midland Region, when three new oil-fired turbine vessels, now on order, go into service. They will cost over £4,000,000. Each ship will convey 1,800 passengers, an increase of 300 over the present vessels and be fitted with stabilisers. Modern restaurant and cafeteria facilities will be provided, and there will be an enclosed promenade deck running the whole length of the third class passenger accommodation. The builders are Wm. Denny & Bros., and Harland & Wolff Limited. The new ships will replace the three "Dukes" which have been working on this route for over 25 years.

Railway Services and Gatwick Airport.—At a public inquiry into the plans of the proposed new Gatwick Airport, Mr. G. Wynne Davies, Assistant Commercial Superintendent, Southern Region, said that improved railway services in connection with the project would cost just under £1,000,000. The cost of the station improvements would be about a quarter of the sum and the provision of rolling stock, and so on, would bring it up to about half. The Ministry of Transport estimated that in the first full year 340,000 passengers would use Gatwick Airport. This included those carried by the charter companies. British European Airways estimated that the number of their passengers would be 305,000. It was estimated that three-quarters of the passengers would travel by rail. Mr. Wynne Davies explained that a semi-fast service to London would be

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

TRAFFIC TRAINING OFFICER, RAILWAY DEPARTMENT required for the GOLD COAST Local Civil Service for two tours each of 18-24 months in the first instance. Non-pensionable. Salary £1,700 a year. Gratuity at rate of £150 a year. Outfit allowance £30. Free passages. Liberal leave on full salary. Candidates must be M.Inst.T. or A.M.Inst.T., have had at least 10 years Railway experience including lecturing to Railway personnel on railway or transport subjects and be able to coach candidates for Institute of Transport examinations. Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3B/34121/RA.

GUAQUI LA PAZ RAILWAY.—Assistant accountant. Qualifications: Man who has passed intermediate examination of recognised accountancy body preferred. Knowledge of railway accounts an advantage. Preferably single between 28/35 years of age. SOUTHERN RAILWAY OF PERU. Locomotive, Carriage and Wagon Senior Draughtsman required, 30/35 years of age. Qualifications: Must have served a full general apprenticeship in an engineering workshop (preferably railway) and have at least five years drawing office experience with some time in an executive capacity. A knowledge of Spanish an advantage. Future prospects. Apply to The Secretary, Peruvian Corporation Limited, 144, Leadenhall Street, London, E.C.3.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Methods. In collaboration with Ernest I. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. Price 20*s*. By post 20*s*. 6*d*. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

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BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25*s*. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33, Tothill Street, London, S.W.1.

achieved by extending the present service between Littlehampton and Three Bridges. A loop line at Gatwick would be provided.

Robert Stephenson & Hawthorns Limited.—It is announced by Robert Stephenson & Hawthorns Limited that the dividend for the year ended December 31, 1953, will be 10 per cent, compared with 10 per cent and bonus 3 per cent for the preceding year. Net profit, after tax, is £21,067 (£50,152).

Railway Benevolent Institution.—At the meeting on March 23, the board of the Railway Benevolent Institution granted annuities to ten widows and six members involving an additional liability of £300 19*s*. per annum. Fifty-four gratuities also were granted to meet cases of immediate necessity. Grants made from the Casualty Fund during the month of February amounted to £815.

Super Oil Seals & Gaskets Limited.—The trading profit of Super Oil Seals & Gaskets Limited for 1953 was £172,601 compared with £199,685 for 1952. Interest receivable was £1,500 (same), depreciation £30,428 (£39,034), pension scheme contribution £6,282 (£6,705), directors' fees £11,769 (same) and tax £83,288 (£101,830) including excess profits levy £12,000 (£19,000). Current assets total £538,574 (£512,515) and current liabilities £205,685 (£150,738).

Through Tickets from Provincial Stations via Harwich-Hook.—British Railways, Eastern Region, announce that the through booking from provincial stations to the more important destinations in Holland, Germany, Scandinavia, and Finland via Harwich and the Hook of Holland will now be extended to include Switzerland and Italy. Stations from which such tickets are available include Cambridge, Chelmsford, Colchester, Doncaster, Ipswich, Lincoln, Norwich Thorpe, and Sheffield Victoria. International one-piece paper type tickets incorporating a boat portion are used. In addition, through registration of baggage to and from Ipswich, Lincoln, and Sheffield Victoria via Harwich Parkeston Quay is being continued.

New Station at Twickenham.—A new station was brought into use at Twickenham on March 28, taking the place of the original buildings constructed over one hundred years ago. The new station has five platforms, including two bay roads for football traffic. Centrally heated general waiting rooms and ladies' rooms are provided, with a new style of platform lighting which gives a high degree of illumination and a clear indication of the station name signs. Access to the platforms is by a covered footbridge leading from London Road, with an additional entrance for season ticket holders. Another footbridge, 10 ft. wide, connects all platforms to provide for the rapid dispersal of football crowds. Until the building housing ticket hall, parcels office, telephone kiosks, and other amenities is completed, a temporary ticket office at the London Road entrance is being used.

Recovery of Waste Paper.—The statistics presented in the report for 1953 of the Waste Paper Recovery Association Ltd., a non-profit-making organisation operating in collaboration with the Ministry of Materials, show that the bad effects of the early 1952 trade recession upon waste paper recovery have been largely dispelled and that a much freer market for this raw material now exists. Waste paper is an essential raw material to the board mills and consumption for the last four months has approached once again a rate of 1,000,000 tons a year. Exports of waste paper in 1953 totalled 51,534 tons, valued at £734,791.

Neglect of Cattle in Transit: Denial by British Railways.—British Railways, London Midland Region, replied last week to allegations by the Irish Livestock Exporters' Association that cattle were neglected or subjected to cruelty when being carried by rail. On one specific allegation that on November 18, 1953, 18 cattle were injured and three were dead when a train from Holyhead reached York, it was pointed out that the special train broke down because of a locomotive defect and had to be detained later in the journey for the cattle to be attended to. With regard to 69 cattle travelling from Birkenhead to York on February 22, the London Midland Region stated that a qualified cattleman who accompanied the train gave attention to fallen animals during the journey, but the reported casualties were found at the destination.

Institute of Transport: Annual Dinner of Northern Ireland Section.—The annual dinner of the Northern Ireland Section of the Institute of Transport was held at Belfast Castle on Tuesday, March 18. Sir Reginald Wilson, Member of the British Transport Commission, deputising for the President, Sir Brian Robertson, responded to the toast of "The Institute of Transport," which was proposed by Mr. D. H. Alexander, Principal of the Belfast College of Commerce. The Prime Minister of Northern Ireland, Viscount Brookeborough of Colebrooke, responded to the toast "The Government and Prosperity of Northern Ireland," proposed by the Lord Mayor of Belfast, Alderman Sir Percival Brown. The toast "Our Guests" was proposed by Mr. Robert Flack, Member of the Transport Tribunal for Northern Ireland, and responses were given by Lt.-Colonel A. O'N. C. Chichester and Mr. T. C. Courtney, Chairman, Coras Iompair Eireann. Mr. G. B. Howden, Chairman of the Ulster Transport Authority and of the Great Northern Railway Board, who is Chairman of the Northern Ireland Section of the Institute of Transport, presided at the function.

Midland Railway Company of Western Australia.—The results of the Midland Railway Company of Western Australia for the year to June 30 last show total assets of £2,709,000 (£2,731,000) and current assets of £94,000 (£146,000). Current liabilities total £101,000. Interest on the second mortgage cumulative income debenture stock has been paid to June 30, 1948, only. Arrears of interest for the five years to June 30, 1953, not provided in the present accounts, and payable out of future profits or otherwise, amount, before tax, to £118,472. Provision for renewals and referred maintenance stands, in the balance-sheet, at £200,400 (£190,400).

Jonas Woodhead & Sons Limited.—The group net trading products of Jonas Woodhead & Sons Ltd. for the year ended September 30 last were £305,650 (£273,663). Net profit was £54,393 (£50,695). The total dividend is increased to 17½ per cent from 15 per cent. Consolidated current assets at the year end exceeded current liabilities by £819,791 (£824,399). The directors have Treasury consent to make an issue of 525,000 5*s*. ordinary shares by way of capitalisation of £131,250 of reserves and an issue for cash of 300,000 5½ per cent £1 redeemable cumulative preference shares. It is proposed to offer the preference shares at par to ordinary shareholders.

Westinghouse Exhibits at the B.I.F.—The Westinghouse Brake & Signal Co. Ltd. will be exhibiting selections from their range of products at the forthcoming British Industries Fair. In the display will be a barrier machine for level crossings, the arm of which is raised electrically and carries special warning lamps giving all-round visibility. Also exhibited will be a short range colour-light signal as used for mine signalling. Pneumatic equipment for railway and road braking and for industrial installations is illustrated by an exhibit that

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has working examples of compressors, reservoirs and so on. Steam-driven compressors and sectional samples of equipment add to the interest of this section. A live demonstration of the Dalic plating process will be a feature of the rectifier section, and will incorporate a small lathe powered by a d.c. motor and a magnetic chuck, both deriving their direct current from a Westinghouse "Westalite" transformer/rectifier set. The display will be backed with a selection of technical literature.

American Locomotive Company Results.—Net sales for the year 1953 were a record in the history of the American Locomotive Company. They amounted to $440,710,000 compared with $349,953,000 in 1952. Net income was $7,401,000 ($6,444,000) and equal to $3·40 ($2·83) a share. The common dividend is $1·40 for each share (same). The net working capital is $48,800,000 ($45,761,000).

Lansing Bagnall Limited at the B.I.F.—The exhibits of Lansing Bagnall Limited at the forthcoming British Industries Fair at Birmingham will include the FD 223 diesel fork truck, the SFS 225 straddle fork truck, the new TD 200 range diesel tractor, and two pallet trucks types PP 230 and HP 50. The FD 223 diesel fork truck is powered by an air-cooled, twin-cylinder Enfield engine, and has a capacity of 2,240 lb. at 20-in. centres and a lift of 10 ft. 10 in. Its maximum sped is 8-10 m.p.h., and it is capable of negotiating, fully loaded, gradients of 1 in 8. The straddle fork truck can lift 2,500 lb. to a height of 10 ft. 10 in., and a patent pivot system ensures that all wheels maintain contact with uneven floor surfaces; regenerative braking, a feature of Lansing Bagnall trucks, is provided; the maximum speed is 4½ m.p.h. Many of the fork trucks exhibited will have its new fixed mast-tilting carriage. Other new features will include a tilt indicator and an overload indicator, showing if the load is within the capacity of the truck.

Forthcoming Meetings

April 3 (*Sat.*).—Permanent Way Institution, Leeds & Bradford Section, at about 9.30 a.m. Morning visit to Charles H. Roe Limited, Carriage Works, Crossgates, Leeds.

April 3 (*Sat.*).—Permanent Way Institution, East Anglia Section, at Ipswich at 2.15 p.m. Paper on "My early railway service and membership of the P.W.I. since 1922," by Mr. F. Wensley.

April 3 (*Sat.*).—Permanent Way Institution, London Section. Joint meeting in London with Newcastle Section at the London Headquarters of the British Transport Commission, 222, Marylebone Road, N.W.1, at 3.15 p.m. Paper on "Horticulture and the railways—economical and decorative aspects," by Mr. B. J. J. Moran (L.T.E.).

April 5 (*Mon.*).—Institute of Transport, Metropolitan Section, at 80, Portland Place, London, W.1, at 5.30 for 6 p.m. Paper on "The Port of London Authority," by Mr. E. S. Birch.

April 6 (*Tue.*).—Permanent Way Institution, Leeds & Bradford Section, in the British Railways Social & Recreational Club, Ellis Court, Leeds City North Station, at 7 p.m. Paper on "Some aspects of steelworks railroad systems," by Mr. H. G. Ross, of Steel Peech & Tozer, Sheffield.

April 7 (*Wed.*).—Institution of Mechanical Engineers, at Storey's Gate, St. James's Park, S.W.1, at 6.45 p.m. Internal combustion engine group discussion, "The performance of compression-ignition engines under abnormal conditions, etc."

April 9 (*Fri.*).—British Railways, Southern Region, Lecture & Debating Society. Visit to York.

April 9 (*Fri.*).—Stephenson Locomotive Society, at Beale's Restaurant, Holloway, London, N.7, at 6.30 for 7 p.m. Forty-fifth birthday dinner.

April 10 (*Sat.*).—Railway Students' Association. Afternoon visit to Longmoor Camp and the military railway.

April 10 (*Sat.*).—Stephenson Locomotive Society, at 32, Russell Road, Kensington, W.14, at 3 p.m. Annual General Meeting.

April 10 (*Sat.*).—Stephenson Locomotive Society, Scottish Section, at the British Railways Offices, Buchanan Street, Glasgow, at 3 p.m. Paper entitled "Modern Dynamometer Car Testing," by Mr. O. S. Nock.

April 12 (*Mon.*).—Historical Model Railway Society at the headquarters of the Stephenson Locomotive Society, 32, Russell Road, London, W.14, at 7 p.m. Talk on "The London, Tilbury & Southend Railway," by Mr. N. McCracken.

April 13 (*Tue.*).—Institution of Civil Engineers, at Great George Street, Westminster, London, S.W.1, at 5.30 p.m. Paper on "Extension at Takoradi Harbour," by Messrs. A. J. Clark and H. A. Broughton.

April 14 (*Wed.*).—Institution of Railway Signal Engineers, at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, at 6 p.m. Annual General Meeting.

April 14 (*Wed.*).—Stephenson Locomotive Society, Midland Area, at 71, Edmund Street, Birmingham, at 7.15 p.m. Ciné film show: "Rail tours and special trains of 1953," by Mr. W. A. Camwell.

April 15 (*Thu.*).—Diesel Engine Users Association at the Connaught Rooms, Great Queen Street, London, W.C.2, at 12.30 for 1 p.m. Annual luncheon.

Railway Stock Market

As the Budget approaches, stock markets seem to be discarding the uncertainty which was showing signs of developing. British Funds and industrial shares are becoming more active and tend to move higher in price. This reflects hopes of tax reductions as a stimulus to increase industrial production and buy modern plant so as to reduce costs and meet the price competition in export markets. Sentiment this week has been helped by the optimistic tone of the Board of Trade *Economic Survey for 1954*, which concludes that "production should be higher in 1954 as a whole than in 1953, although the prospects for the latter part of the year are inevitably uncertain." The *Survey* also takes the line that even with a further trade recession in the U.S.A., it should be possible to avoid a serious fall in exports if countries in the sterling area and in Western Europe co-operate to keep the wheels of trade moving faster.

The City continues to expect a cut in income tax, and is also rather more hopeful that the profits tax may be modified as well. It is argued that if income tax is reduced, British Funds could rise in price by several points, and in that event leading industrial shares would also move strongly ahead.

Manila Railway debentures have been quiet with the "A" at 83 and the "B" at 73, but few holders are likely to sell, because eventually there must be a settlement in respect of the company's big holding of Manila Railroad bonds; and this could make market prices not only of the debentures but also of the shares worth well over their current levels. The preference shares have changed hands around 8s. 6d. this week and the ordinary shares around 4d.

United of Havana stocks have been steady, but inactive though the income stock at 43¼ and the consolidated stock at 6¼ are estimated to be well below their probable break-up value.

Canadian Pacifics strengthened to $42½, while the 4 per cent preference stock and 4 per cent debentures showed firmness at £65¼ and £88¾ respectively. White Pass issues were also better, with the no par value shares $24¼, the convertible debentures £88, and the loan stock £33¾.

Antofagasta ordinary and preference have been firmer at 7⅞ and 39½ respectively. Mexican Central "A" debentures changed hands around 79½. San Paulo units were 5s. 3d. and Nitrate Rails shares were 19s. 9d. after publication of the annual accounts.

Peru Corporation debentures improved to 56¼, while the preference stock was 6⅞ and the ordinary 2⅞.

A feature has been renewed activity in Dorada ordinary stock on estimates of the break-up value in the event of a take-over offer for the railway. Dealings have ranged from 69 to 72.

International of Central America gold bonds changed hands at 117. Brazil Railway bonds marked 6¾, while activity persisted in Guayaquil & Quito 5 per cent first bonds up to 52½.

Old Russian railway bonds again attracted a little speculative buying; Russian South Eastern marked 1½.

In road transport shares there was an advance of 6s. in West Riding to 32s. 9d. on the final dividend of 10 per cent on the larger capital arising from the share bonus, making a total of 15 per cent for the year. Total dividend for 1952 on smaller capital was 10 per cent. Southdown firmed up to 29s. 3d. Lancashire Transport were 46s. B.E.T. 5s. "A" deferred units remained active on higher dividend expectations, but at 42s. 3d. did not keep best prices.

Among engineering and kindred shares, Guest Keen at 56s. 9d. kept active on higher dividend hopes. Vickers (53s. 9d.) also continued prominent on the possibility of a bigger distribution, and Babcock & Wilcox rallied to 49s. 3d. United Steel firmed up to 23s. 9d. after the Chairman's statement that the current year's earnings are likely to be well over the prospectus estimate. The current market view is that this may mean an increase in the dividend from 9 per cent to 10 per cent.

Beyer Peacock were 36s., Charles Roberts 5s. shares 16s., Birmingham Carriage 30s. 9d., Hurst Nelson 42s. and North British Locomotive 13s. 9d. Vulcan Foundry rose to 24s. 9d., Gloucester Wagon 10s. shares were 17s. and Wagon Repairs 5s. shares 12s. 4½d.